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CLARENCE GOODE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Yacka Gum.

In a letter of transmittal of Bulletin No. 6 of the Chemistry Department, the Director mentions that much time of the Department has been devoted to the economic products of grass trees, on account of the great extent of country covered by these trees, and the occupation by grass trees of land at present not found valuable for other purposes. The resin of the trees (yacka gum) appears likely to be of considerably greater commercial importance in the future. The present methods of collecting are wasteful, both of trees and resin, and it seems necessary to direct the attention of the public to the facts that the resin may be gathered without killing the trees, and that owing to the very slow growth of the grass trees they cannot readily be replaced by new trees, and a valuable asset to the State may be lost. Efforts should be made to preserve the trees as much as possible.

### Department of Chemistry Publications.

From the Director of Chemistry (Mr. W. A. Hargreaves, M.A., D.Sc., B.C.E., F.I.C.) has been received a copy of Bulletin No. 5 of the Department of Chemistry. The Bulletin, on "Foaming of Boiler Waters," embodies the results of researches made by the Director into the causes of priming that takes place when attempts are made to use in locomotive boilers many of the natural waters of South Australia.

A copy of Bulletin No. 6, being a report of an investigation of the economic products of grass trees, by Mr. J. C. Earl, F.I.C., has also been received.

### Statistics.

The Government Statist (Mr. W. L. Johnston) has published, under the authority of the Chief Secretary (Hon. A. W. Styles, M.L.C.), the first issue of "The Statesman's Pocket Year Book of South Australia." This little volume contains a considerable amount of statistical and other matter, set out in a handy manner.

### The Fox Pest.

The necessity for concerted action on the part of landholders to destroy foxes was referred to at both the 1916 and 1917 conferences of the South-East Branches of the Agricultural Bureau, and it is quite apparent that this animal is a source of serious trouble to the sheep-breeder. The Advisory Board of Agriculture gave consideration to the matter at its meeting held on the 9th May. In the course of a discussion, Mr. A. M. Dawkins rather objected to the ordinary method of poisoning on the ground that it led to the destruction of so many useful native birds, particularly magpies. He thought a better plan would be to poison pigeons and various valueless small birds, which the foxes would take readily. The Director of Agriculture (Professor Perkins) pointed out that the distribution of a few baits of that character would not suffice. To obtain thoroughly satisfactory results it was necessary literally to sow the baits. When the

latter course had been pursued at Roseworthy College between 80 and 90 dead foxes had been found, and no lambs had been lost. He admitted that magpies had been killed wholesale, but, so far as he was aware, they were the only useful birds that had been destroyed. This year, with the mice so numerous, it would be necessary to distribute the baits in hundreds. The Chief Inspector of Stock (Mr. T. H. Williams) directed attention to an important aspect of the poisoning policy, in which strychnine is almost invariably used. He explained that years ago an experiment was inaugurated in Europe with a view to ascertain how long the poison remained active in the bones of poisoned animals. Several different kinds of these, including monkeys, were employed, and it was found that in some instances the poison was still active after 14 years. Seeing that certain of the domesticated animals, particularly cows and pigs, were given to chewing bones, it was desirable that owners should reflect before engaging in wholesale poisoning with strychnine. There had been brought under his notice numerous cases in which cattle and pigs had died through eating carcasses of rabbits that had been poisoned months previously with the alkaloid named, and he considered that a large number of the deaths now regarded as more or less mysterious were really attributable to the same cause. After further discussion it was resolved, at the instance of Professor Perkins, to secure a report from the Director of the Department of Chemistry (Dr. W. A. Hargreaves).

### Worms in Pigs.

From time to time requests are received for direction as to the treatment of pigs affected with worms. The Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), in replying to a correspondent, stated that the worms described were known as *Ascaris suis*, and a heavy infestation, such as 104 in a pig, brought about a specific worm poisoning, as well as weakness arising from their utilising the food that the pig should absorb. General treatment consisted in always allowing cinders or large charcoal and some ashes to be in a box in the sty where the pigs could eat it at will, and also to put in the feed once a day for three or four days crushed castor oil beans at the rate of 1oz. per pig, the strong getting a little more, the weak a little less. Owing to the high cost of drugs it was often cheaper nowadays to use proprietary articles, such as worm tablets, rather than have special ones made up. For pigs of that age they should be used as for children of 5 to 7 years. If special powders were desired, the following might be used:—Santonii, 7grs.; calomel,  $\frac{1}{2}$ dr.; areca, 1dr.; sugar,  $\frac{1}{2}$ oz. That made one powder, and might be given to each pig in the morning fasting, food being given an hour or two later. Treatment was for three days, then stopped for 10 days, and repeated. For older pigs a cheaper powder, consisting of equal parts of sulphur, saltpetre, and charcoal, might be given at the rate of a flat tablespoon per day to each pig in food, and continued for a week or so. Pigs reinfested themselves from dung, so the sties needed to be kept clear, and no access to the dung heap was allowed. If young pigs were not cleared of worms, all the profit was wasted in feeding the latter.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

## VETERINARY INQUIRIES.

[Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Veterinary Lecturer.]

[Extraordinary pressure on space has rendered it necessary to very considerably curtail the inquiry department. Replies to those questions of more general interest only have been published; however, every query received has been replied to through the post.—ED.]

"P. J. G.,'' Port Vincent, asks advice in regard to a bull to be dehorned.

Reply—Five months is too old to attempt to dehorn by solvents such as caustic potash according to the method often described in these replies. In this case a tenon saw must be used close to the skull. This will leave a hole that will have to be plugged with tar and tow until covered by the forelock. It is hardly advisable to dehorn if the bull is a valuable one, as the horns are necessary for character.

"C. W.,'' Whitwarta, has a cow with one quarter enlarged and black; ratten and sloughing.

Reply—This is not cancer, but black garget, a very severe form of mastitis, and after a month, as it is still getting worse, there is hardly any hope of recovery; but if treatment is to be tried, give 10 drops of tincture phytolene every six hours internally, and bathe the quarter with 1oz. of the same in half a pint of olive oil made warm, at least three times a day, and in between keep up a marshmallow poultice to the quarter.

"F. D.,'' Mundoorra, has a foal with bumble foot.

Reply—Little can be done to prevent further deformity, but the foot may be pared as near normal shape as possible, and a light shoe put on, which must be removed at least once a month. A slight blister round the coronet every three months may be of use.

"E. O. J. G.,'' Spalding, has a mare with supposed greasy heel.

Reply—Clean the heel thoroughly with petrol—do not wash with water; do this twice a week. Then dress with an ointment made of Venice turpentine 1 part, camphor 1 part, eucalyptus 1 part, lard 7 parts. Plaster this on thickly and cover with a bandage; renew each time the heel is cleaned until offensive discharge stops; then dress twice daily with white lotion made of 1oz. sulphate of zinc, 1oz. sugar of lead, 1 pint water, 1 pint methylated spirit.

"A. J. W.,'' K.L., has a cow with lump about size of goose egg on jaw, another on throat, which do not impede beast eating, and it has not lost condition. Supposed to be due to grass seeds.

Reply—The query is quoted in full, because the writer evidently is unacquainted with the grass seed suggestion. Grass seeds seldom affect two glands. The symptoms are highly suspicious of tuberculosis, and the law requires an owner of such a beast to isolate it and inform the Chief Inspector of Stock, Adelaide, of its condition. Therefore no treatment can be suggested until permitted by an officer of the Stock and Brands Department.

"W. L." Wynarka, is troubled with mice in underground tank.

Reply—As time does not permit of the tank being cleaned, it will be feasible to render the water potable for stock by the following means:—As the tank holds 15,000 gallons, take 15lbs. of alum, and put into a number of small bags, such as rolled out bags; tie these to a board nearly as long as the tank is wide and tow the board up and down till all dissolved. A few hours later take 30lbs. of slaked lime, and repeat the process with it. This will precipitate matter in suspension, and it is very difficult for injurious organisms to exist in slime at the bottom of such a tank if the slime is not disturbed. Should there be an offensive smell, in addition to the above, dissolve 15lbs. of permanganate of potash, Condy's crystals, in a similar way.

"W. L." Wynarka, seeks treatment for horses affected with sore shoulders.

Reply—The mixture of 2ozs. white lead and 1 pint neatfoot oil can be used with impunity, almost indefinitely, as absorption is hardly appreciable from the surface of the sore. The mixture is in constant use on the Government farms, and no bad results have ever occurred.

"C. Bros." Penwortham, have a horse morish, lies about, stretches out, arches neck in, has recently been put on monkey chaff.

Reply—The symptoms are not at all uncommon; they are those of mould and bloodworm poisoning so often referred to. Give a five-drain physic ball, then, when that has ceased to secrete, give twice daily for a week a tablespoon of Fowler's solution and a teaspoon of sulphate of quinine in food or mixed with a little honey and put in mouth. Of course stop the affected chaff, and put on bran or green feed only for the week.

"J. E. W." Winninowie, has a mare with swelling in front of and on udder after weaning.

Reply—Such swellings are alarming, but not serious. When the udder is put out of action there is an amount of material to be removed by the lymphatics, and this is the swelling. Do not use turpentine, but the butter you have been using would do good. A satisfactory treatment generally is to give the mare a teaspoon of saltpetre in her food two or three times a day for a few days, and rub the udder twice a day with a mixture of half lime-water and olive oil. Milking the mare when weaning is seldom necessary, except in special cases, and then only a little to relieve; it only prolongs the agony otherwise.

"J. V. H." Minarie, has a brown draught mare, 12 years, about and above the coronary skin very sore and bloody discharge oozes out; the hair sticks straight out and falls out; the discharge sticks and irritates, so that the beast stamps and bites the part. A peeling rubbery substance forms where healing takes place; she seems better when working.

Reply—A very good description of the disease known as vilitis, which is constitutional as well as local, and very difficult to eradicate. The feed, consisting of bran, cocky chaff, oats, and hay is all right, but the oats must be limited and the bowels kept open with bran. A tablespoon of Fowler's solution of arsenic should be given in the fool twice daily for three weeks. Local treatment commences with two or three days' bran poulticing, this is followed by dressing twice a day with dilute acetic acid (3 per cent. strength); after a few days the part must be well plastered with Venice turpentine and camphor ointment, one of each to four of had; after this has been on a few days it is cleaned off with petrol, and the acetic acid used again. This routine has to be kept up for months.

## SOUTH AUSTRALIA.—CEREAL AND HAY CROPS, 1916-17.

Wheat, 43,830,972bush. (average, 15.85bush.); barley, 1,839,692bush. (average, 16.99bush.); oats, 1,825,503bush. (average, 11.16bush.).

The preliminary results of the recent harvest have now been issued by the Government Statist (Mr. W. L. Johnston), who points out that as the statistical year for cereal, dairying, pastoral, horticultural, &c., production will in future end on June 30th, the annual collection by the police visiting the holdings cannot be made till that date. Special arrangements, however, were made to collect particulars of the cereal and hay crops through the post, but the results must be considered as preliminary until the annual collection referred to has been completed. It is not anticipated, however, that it will be necessary to materially revise the results now issued. For the purpose of the present estimate forms were supplied to 17,427 farmers, and replies received from 16,306. The results for the balance of 1,121 outstanding have been estimated. Of the total number 15,683 grew wheat, 4,337 barley, and 8,573 oats.

### WHEAT.

Of wheat, 3,121,574 (3,220,645) acres were sown, a decrease of 99,071 acres as compared with the previous season. The area was distributed as follows:—Grain, 2,765,383 acres; hay, 328,285 acres; fed off, 27,906 acres. It is estimated that 43,830,972 (34,134,504) bushels of wheat were reaped, an increase of 9,696,468bush. on the previous year; the average per acre being 15.85 (12.46) bushels, increase 3.39bush. per acre, and 2.59bush. greater than the previous highest average of 13.26bush. in 1909-10. The cut of hay, 443,583 tons, with an average of 1.35 tons per acre, shows a decrease of 310,933 tons on the record season, 1915-16, but was well up to the average cut.

### BARLEY.

The total yield of barley, 1,839,692bush., with an average of 16.99bush. per acre, exceeded the previous record season (1915-16) by 142,022bush. Of the total yield 1,375,419bush. were returned as malting.

### OATS.

1,825,503bush. were harvested, averaging 11.16bush. per acre. This is a decrease of 308,871bush. and 5.71bush. per acre on the record season, 1915-16. The cut of oatmeal hay, 172,521 tons, averaged 1.15 tons per acre, and though 119,546 tons below the record yield of 1915-16, is substantially greater than any previous cut.

### GENERAL.

There appears to be a great increase in the number of crops grown on shares. The harvesting weather was most unfavorable, and, combined with the shortage of bags and labor at critical periods, resulted in a considerable quantity of grain being spoiled in various parts of the State. Harvesting was not completed in late districts until the end of April.

## THE AGRICULTURAL BUREAU.

### CONFERENCE AT WAIKERIE.

The Murray River Branches of the Agricultural Bureau met in conference at Waikerie on May 14th and 15th, and the gathering ranks as one of the most successful and instructive conferences that has been held. Consideration was given to a number of questions of importance to irrigation settlements, and, as is usual, papers were read by members of the Branches, and addresses delivered by officers of the Department of Agriculture.

#### THE DELEGATES.

Mr. Binks Williams, chairman of the Waikerie Branch, presided, and the following visiting delegates were present:—Kingston-on-Murray, Messrs. J. and W. J. Weatherall and J. E. Harrington; Murray Bridge, Messrs. R. S. Bell, J. Comyns, W. Fletcher, G. Lane, and E. Nelson; Mypolonga, Messrs. G. Horner, M. Rayner, and G. Wadrowski; Raimo, Mr. J. G. Odgers; Renmark, Messrs. G. Agars, F. H. Bassey, F. Cole, M. B. Geneste, F. Hooper, W. E. Muspratt, R. Nuttal, L. Pitt, H. S. Taylor, M. Tayler, and W. H. Waters; Berri, Messrs. W. Lewis, W. Padman, N. Cock, C. Harris, and C. Hounslow. In the absence of the Commissioner of Crown Lands (Hon. C. Goode), who was detained in Melbourne, Mr. G. Jeffrey (Vice-Chairman of the Advisory Board) represented the Department of Agriculture, and there were also present the Director of Agriculture (Professor A. J. Perkins), Mr. G. Quinn (Government Horticultural Instructor), and Mr. H. J. Finnis (Acting Secretary to the Advisory Board).

#### WELCOMING THE VISITORS.

The Chairman, in his opening address, extended a cordial welcome to the visitors, and said that he was gratified to see so many present. Previous conferences had been very successful, and he was convinced that that would be a successful conference also. He regretted that the Commissioner of Crown Lands (Hon. C. Goode) was unable to be present, as he was delayed in Melbourne. The Director of Irrigation (Mr. S. McIntosh) had wired his regret that, owing to indisposition, he would be unable to attend the conference. He (the speaker) felt sure that their sympathies would go out to Mr. McIntosh, who was confined to his bed.

Mr. A. E. Ross, on behalf of the Waikerie District Council, said that he was pleased to welcome the visitors to their town. Personally he had felt that the importance of the Bureau had not been properly appreciated. But he was sure that these producers' parliaments were of greater value to the State than a great many people realized. Fortunately they had a good Department of Agriculture in the State. He urged that two matters which must be given attention were the increase in production, and the extension of their work in the directions which would lead them to become more efficient. He was convinced that conferences of the kind they were now holding could not but prove beneficial to the producers of the State.

Mr. J. G. Odgers (Rancho) thanked the Waikerie Branch for having given his Branch the privilege of extending a welcome to the visitors. The Rancho Branch was the oldest in the district, and with the exception of Renmark, he believed that the Rancho Branch of the Bureau was the oldest on the river. Mr. Odgers briefly traced the history of the district from the old village settlements to the present, and contended that the early settlements had caused the Governments to turn their attention to the advantages of settlement on the Murray River.

#### PERTINENT POINTS.

Mr. G. Jeffrey (Vice-Chairman of the Advisory Board), in declaring the conference open, said that he desired to personally apologise for the absence of the Minister, who had been called to attend, with the Premier, at Melbourne, in connection with the wheat scheme. He referred to the fact that there were 190 Branches of the Bureau, representing 5,000 members, who were represented at the front by about 10 per cent. of their numbers. He urged members to do all they could, despite depleted numbers, to keep the Branches going until their comrades returned from the war with honors. He went on to speak of Major Johnston's report on the river, and touching on irrigation, said that though in dried fruits they had caught up to the demand, he was convinced that after the war such a new set of conditions would be evolved as would lead to a greater demand for their products. He was satisfied that in the near future there would be half a million people settled on the river, and by the system of preference, and the shutting out of their strongest competitors, there would be an unlimited market for their products. But they would have to increase their production, and pursue a vigorous policy by the adoption of other and more perfect systems of grading; and if they did that he was satisfied that there was a great and glorious future for the river settlements. South Australia was singularly fortunate in having in its agricultural department so excellent a staff, which was so well and capably led by Professor Perkins. (Applause.) He eulogised the Agricultural Bureau, and in conclusion stated that he was pleased to be present, and in declaring the conference open he wished the delegates every success, and a happy and prosperous future for the district.

#### THE CODLIN MOTH.

Mr. Harrington (Kingston) said that the codlin moth had made its appearance on, he thought, all the holdings in Kingston, and as no settler there seemed to understand the matter, he asked for a discussion on the subject.

Mr. Quinn said that from now on the insect existed as a caterpillar in trees and in crevices of fruit boxes. It developed into a cocoon, and gradually developed as similar insects did, and in the blossom season the parent moth deposited eggs in the plants, which eventually became caterpillars, and entered the fruit. The remedy was to keep the trees clean, and to keep bandages of flannel, or even newspapers, round the trees, which enabled the grower to gather the caterpillars and destroy them. That was the old style; but now the arsenal of lead spray had been found most effective for the purpose of destroying the insects at the proper time, which was in the early stages of the

caterpillar's life. The first spray should be given when the blossoms fell away from the tree; then a fortnight afterwards, and a third spraying a month or six weeks later. That was the method of dealing with codlin moth, and with four sprayings, where the work was properly done, the remedy was effective.

In reply to a question, Mr. Quinn said that fruit which came into a fruit-growing district should be accompanied by a certificate of cleanliness. If a merely superficial examination of the fruit at the top of a case was made, it would not be effective, and even if every apple was examined it would not necessarily mean that the moth would be detected.

Mr. Goodchild said that until every person who had an odd tree or two was compelled to spray there would be trouble. There was the danger from old cases being used for various purposes.

Several speakers referred to the success of spraying operations, and Waikerie growers were advised to procure a plant on the co-operative principle which could be then used on every orchard. As far as Kingston was concerned the settlers were advised to take the trouble in hand at once, and if this were done it would be possible to keep the moth in check.

In reply to a question Mr. Quinn said that a late ripening fruit like the Rome Beauty required spraying at the end of January.

#### EXPORT OF PEARS.

Mr. F. H. Basey (Renmark) submitted the following resolution:—  
"That this conference of River Murray Branches of the Agricultural Bureau considers that in view of the large and growing acreage of pears planted on the river, the matter of the export of pears is a very important one, and desires to emphasize the necessity for the provision of more satisfactory refrigerating arrangements (which must be combined with self-registering thermometers) on the carrying steamers." In speaking to the motion, he said that pear export was a most important matter to men on the river. Some men had talked of pulling up their pear trees, but he was a believer in the exportation of pears, and his firm had successfully exported the fruit. They had realized 10s. per case in London, and it cost them 6s. per case to get the fruit to London. Other growers with more experience had received 15s. per case, and Victoria had done very well in shipping Duchesse pears to London; consequently he did not see why South Australia should not make a success in the same direction. He understood that a lot depended on the ship's engineer in regard to keeping the pears at the requisite temperature on the steamers, and he held that the exporters should not be at the mercy of one man. The trouble was that while apple exportation had been proved profitable, the exportation of pears was still a speculation. It was certain that pears required to be kept at a lower temperature than apples. A "temperature clause" should be inserted in every bill of lading, and self-registering thermometers should be installed in the refrigerating chambers of the ships. The conference should show that it was convinced pears could be carried profitably to London, and by carrying the motion they would strengthen the hands of the Government.

Mr. W. Lewis (Berri), in seconding the motion, said that some growers in Berri had suggested pulling up their pears and planting currants. There should be some outlet for the pears, and if they could solve the question of export, all would be well, as there was no doubt that the fruit could be grown.

Mr. Quinn referred to a conference of growers in Melbourne, who had waited on the Minister for the Navy (Mr. Jensen), who had assured them that a clause would be included in the bills of lading of ships controlled by his department to provide for a temperature being kept at a degree which would be suitable for the fruit. There was a large market in Europe for the pear. Until the growers arranged for the cool storage of pears at the wharf, and the conveyance in properly constructed railway vans was provided for, there would always be doubt about the successful exportation of pears. They might rave at steamship companies, but there were faults to be remedied a little nearer home.

#### CITRUS GROWERS' ASSOCIATION.

Mr. Cole (Renmark) moved—"That in the opinion of this conference the time has arrived when a citrus growers' association should be formed." Growers had been obtaining good prices for Washington navels, but the time was coming when they would not get these prices. He contended that there was a necessity for central packing sheds, where the fruit could be packed and graded systematically. An English firm had advised him that a better system of packing was necessary, and he held that they must take steps in the direction of keeping up the continuity of supplies to the overseas market with a certain number of cases of fruit, irrespective of the requirements of the local market. It was admitted that the properly graded and well-packed fruit commanded the highest prices.

Mr. Ross (Waikerie) seconded the motion, but urged that if they paid attention to the Australian market at present they would have enough to do. It had to be realized that they would have to be content to get 6s. per case for Washington navels at the orchard, and it should be arranged that river oranges could always be obtained in the market, and not have, as at present, a glut one week and nothing the next. The great thing was to regulate the supply in accordance with the demand. He thought the various settlements could get together and make arrangements to supply the markets and avoid gluts. A lot of money had been lost through haphazard systems having been followed, but when the increased quantities of oranges were available they would have to have system. If they did this, then he was satisfied that it would pay them to dispose of Washington navels at 6s. the case at the orchard.

The motion was carried unanimously.

Mr. Ross (Waikerie) moved—"That steps be taken in each irrigation settlement on the river to appoint committees to consider the formation of a citrus growers' association, to draw up suggestions and exchange views with one another, with a view to the organization of an association as early as possible; and, further, that the Renmark

Branch be requested to invite the co-operation of Cullwoa and Milndura." Mr. W. Lewis (Berri) seconded the motion, and urged that the committee should be formed at once. Mr. Cock (Berri), Mr. Waters (Renmark), and Mr. Taylor (Renmark) supported the motion. The motion was carried unanimously.

#### A GREATER RANGE OF PRODUCE.

Mr. A. E. Ross (Waikerie) urged that steps be taken to look after the interests of growers in regard to the overseas markets in respect to dried fruits. With preference within the Empire, they would have a great market in Canada, England, and the other Dominions, and all they needed was a preference of a penny. Then there was the question of wine grapes, and he felt that there was a great future for the river settlements in this direction. If the Government erected wineries and leased them to the settlers, it would be well; but if the Government would not do that, the settlers would have to combine and provide them for themselves. Then there was the question of canning the fruit, for which there was a large and growing demand for the high-quality article for Sydney, Melbourne, and India. He did not think that dried apricots and peaches were attractive looking, and he preferred the properly canned article. He thought they would get good returns from tobacco growing. Another payable proposition was linseed, grown on the unirrigated sandy soils, which would grow the best linseed that could be produced. From the figures he had been given he was convinced that linseed raising was a better proposition for the small man than wheat. Canary seed was also a payable proposition, and he was informed that little expense was necessary beyond the ordinary implements of the farm.

Mr. Francis (Waikerie) moved—"That this conference respectfully requests the Government to experiment with lines now imported into Australia, such as linseed, canary seed, prunes, tobacco, and figs; such experiments to be carried out at Berri, under the supervision of the Renmark and Berri Branches, or at Mypononga, under the supervision of the Murray Bridge and lower river Branches, on the same lines as wheat-growing tests are carried out at present." Mr. H. S. Taylor, in seconding the motion, said that cotton in small lots, linseed, and tobacco could be grown on the river. Mr. Shields (Renmark) said that he had experience in Glasgow of linseed which came from the Argentine, and was crushed and the oil used for cattle cake. They received from £17 to £58 a ton for the oil, but when it got to the higher prices the Japanese sent in Soya bean oil, which was largely used. He did not know whether they could grow the linseed and compete with Glasgow with the high rate of wages which ruled in Australia.

The motion was agreed to.

#### GOVERNMENT STEAMER WITH DAIRY PLANT.

Mr. W. Francis (Waikerie) moved—"That the Government be asked to take into consideration the question of providing a steamer fitted up with a butter-making plant, and also cool storage accommodation for butter, cheese, mutton, and pork." He said that sheep, lambs, and pigs could be slaughtered at the irrigation colonies and forwarded by such a steamer to townships along the Paringa, Loxton, Waikerie, and

Morgan railway lines. Settlers could deliver cream to the boat to be made into butter and forwarded to any part of the State. At present surplus butter has to be forwarded to the city and sold at pastry prices. In the district from Swan Reach to Mannum some years ago settlers were only receiving from 6d. to 8d. per lb. for their butter at the best. A steamer was put on by Captain Randell to run regular weekly trips, with a time table for each landing, and the settlers started forwarding their cream to city factories, and received from 1s. to 1s. 2d. per lb.; and during the dry nineties those settlers were able to make a living on their holdings, the extra 4d. to 6d. per lb. making a large increase in their weekly income. The Government were opening up a large area of fresh land for irrigation, and if facilities were provided, lucerne growing for dairying and lamb raising would pay well on the upper river.

Mr. F. H. Basye (Renmark) seconded the motion, which was agreed to.

#### CANNING AND JAM FACTORY.

Mr. J. B. Murdoch (Waikerie) moved—"That the Government be asked to take into consideration the question of establishing canning, pulping, and jam factories along the river."

Mr. W. Francis (Waikerie) seconded the motion.

Mr. Beverley said there was a great deal to be said for the motion, as there was a great demand for canned fruit. He had for the last two years dealt with the apricot and pear crops by pulping.

Mr. A. E. Ross said the question of canning was out of the question this year, but if they could pulp the fruit so much the better.

The motion was carried unanimously.

#### MANURING ORCHARDS.

Mr. W. R. Lewis (Berri) introduced the question of manuring orchards.

Mr. Quinn said he had to confess that he knew little about the subject, but if they desired information relative to the various properties of different manures he could be of assistance to them. But he understood that was not what was required. At the experimental orchard at Blackwood manure plots had been conducted, and records had been made. Where superphosphate and bonedust had been used there had been increased growth in the trees, increased fruit yields, and a decrease in bitter pit in apples. But he urged that some patience must be observed, and they must wait until they had had, say, a dozen crops before they could arrive at any definite idea. In California the experiments indicated that there was nothing to equal old farmyard manure. He believed that the Government intended to give him the management of the experimental work at Berri, and he intended to carry out experiments in the direction of manuring. (Applause). He thought that the sandy soils were deficient in potash.

Mr. Waters (Renmark) said that as the result of placing manures (including gypsum) on a nine-acre plot of currants, he had increased the yield of currants from 5 tons to 18 tons.

Mr. Muspratt (Renmark) said that he usually used superphosphate, blood manure, and potash, and had obtained good results. The

trouble had been for some time to get blood manure. The fruit that had had the benefit of potash would be found to weigh heavier than the fruit not so treated. He had had excellent results also with green manuring with peas. He planted a bushel and a half to the acre, and used a cwt. of superphosphate with them.

In reply to questions from Mypolonga, Mr. Quinn said that nitrogenous manures such as blood manures, or blood and bone, were useful to stimulate young trees. But if they could get sufficient farmyard manure, a barrowful to each tree might be used. In regard to two-year-old citrus trees, 1lb. to 2lbs. of the mixture he had mentioned was a suitable quantity, and the fertiliser could be applied in accordance with the irrigation periods. Spraying was effective against brown scale on citrus trees if used at the right time. The best time to spray was when the scale started to spread, and the presence of these pests was the best indication when to spray, as the pests seemed to breed and increase the year round. He did not think he could support the carrying out of manure tests on private blocks. During the past five years the average importation of dried fruits into South Australia was 16½ tons of prunes and 7½ tons of figs.

In reply to another question, Mr. Quinn said that he did not consider that black or brown scale was sufficiently serious to warrant fumigation. The spray pump was all that was necessary.

Mr. Muspratt said that when planting young orange trees he had always used a handful of bone super. He thought also that where, as at Mypolonga, they had to put cover crops in, that it was necessary to manure the second year. He thought that it was advisable before planting citrus trees to dip them in a weak kerosine emulsion.

In reply to a further question, Mr. Quinn advised growers to place back in the soil all the potash they could by the burning of cuttings and other matter taken out of the ground.

Mr. Quinn said they had five varieties of Capri figs, and at Blackwood and on the Adelaide Plains they found that the variety known as Podings No. 3, fulfilled all requirements. The trees would improve, and carry over the over-wintering figs which contained the eggs of the wasps, which, as they developed, entered the heavy spring crop of figs and laid eggs, which developed into the insect about the time of the blossoming of the Smyrna figs, which only fruited once. He had Caprified all the varieties of figs, and was now raising seedlings. He thought there were other figs which would improve with drying as well as the Smyrna. He did not see why we should not grow drying figs, as the samples sent him by Mr. Allan had been as good as any imported dry fig he had seen.

It was resolved to hold the next conference at Berri in May, 1918.

## POTATO WILT.

### SOUTH-EASTERN CROP AFFECTED.

Professor T. G. B. Osborn, M.Sc., recently paid a visit to Mount Gambier and the surrounding district, for the purpose of examining the potato wilt, which was affecting the crops of the district. As a result of this visit, the Professor has supplied the following report to the Director of Agriculture:—

I have to report that, as requested, I visited Mount Gambier during the Easter recess to examine the potato wilt, specimens of which had been sent me by Orchard Inspector Fowler.

I found the site of the original outbreak to be three small contiguous plots, perhaps two or three acres altogether, situated at O.B. Flat. The disease was confined to one spot when first noticed some 14 days prior to my visit. On April 6th almost the whole area was affected.

Unfortunately shortly before my visit a sharp frost had damaged many of the potato tops in the district. It was not possible to determine whether all the dead tops observed were damaged by this wilt I believe not, though a few suspicious plants were noted in a paddock about half a mile away from the original outbreak. The frost had been severe upon the Departmental experimental plots at Mount Gambier, and nothing could be made out there.

On March 2nd last Mr. Alecock had sent me a wilted potato from Rendelsham, but the specimen arrived in the vacation, and was useless when received. He and Mr. Fowler were, therefore, anxious for me to visit Rendelsham, as I was in the district. On the 7th instant, then, in company of Messrs. Fowler and Alecock, I went to Millieant, and thence to Rendelsham and Mount Hope. At Rendelsham the frost had destroyed the tops completely, while the potato plots I saw at Mount Hope seemed free of the wilt. The visit, however, was very instructive, and I was greatly struck by the extraordinary growth of *Solanum nigrum* (local name "blackberry") upon the plots at Rendelsham. I have never seen any weed so thick. I understand that the local soil conditions are such that cultivation is impossible once the crop is in, so that a weed flourishes unchecked. But the luxuriant growth of such a perfectly useless weed must be detrimental to the area.

### SYMPTOMS OF WILT.

There is a sickly discolouration of the leaves, which later become flaccid. Subsequently the stem is involved, the main haulms standing erect, the rest of the aerial parts wilting and becoming brown.

## FUNGI.

Amongst the fungi present in the original specimens there was a copious growth of *Verticillium Albo-atrum*. It is considered to be a harmful pathogenic organism by American and German workers upon wilt fungi, though rather neglected by British pathologists. The symptoms are similar to those observed. After destroying the tops *Verticillium* passes into the vascular region of the tuber and hibernates there. No rot is produced, as by *Fusarium*, but there is a discoloration of the veins at the heel end. I collected several tubers with a discoloration at the vascular end. Amongst the other fungi present was an undetermined species of *Phoma*. This genus of fungi contains some very important parasites, but I know of no species attacking potatoes that produces such a wilt. Culture experiments upon these fungi are proceeding, upon which I will report later.

## CONCLUSIONS.

In concluding, I should like to state that though this disease is at present in an almost negligible amount, the damage that it has done is sufficient to show that serious results might be anticipated were it to spread. At present I know of no other outbreak. There is every reason to fear a spread if the tubers at O.B. Flat are used as seed. The crop will, no doubt, be marketable, but many small-sized tubers may be expected owing to the premature death of the tops. There may be an inclination to sell these for seed, and, in my opinion, it is desirable to prevent this.

It may be that another year, with a different rainfall, the disease will not manifest itself to the same degree. It is hardly safe to risk this. Wilt fungi are soil-infecting fungi, and the Americans, who have suffered severely from them, found them difficult to combat. It seems important, therefore, to check this wilt disease in as early stage as possible.

## PADDY MELON.

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[By F. E. PLACE, B.V.Sc., M.R.C.V.S., Government Veterinary Lecturer.]

The name paddy melon is given to various melon-like plants in South Australia, but the one generally indicated is the small, rough-fruited one, *Cucumis myriocarpus*. The next most common one is a degenerate pie melon, *Citrullus vulgaris*.

Though horses and other stock are very fond of both fruit and vines, they are indigestible, on account of the hardness of the rind, seeds, and

stems, which resist the gastric juice of the horse, and are passed into the small intestine in an unprepared condition when eaten in quantity. Here they set up violent irritation and produce pain and diarrhoea.

This is due to the violent action upon the muscles of the bowel coats by two glucosides contained in them, especially in the small one: these, colocythiin and elaterin, produce violent contractions of the bowels, often resulting in knotting and twisting of those organs. If the material is passed into the large bowels, these glucosides may be broken up, but the indigestible fibre soon brings about mechanical stoppage. Enteritis ensues in either case, and is followed by death.

A correspondent of logical mind inquires if the blindness attributable to paddy melon has ever been sheeted home to the plant; he also asks why cattle, which seem equally as fond as horses of the plant, do not suffer from eating it.

The answer lies in the recognition of certain physiological facts and chemical research. Such glucosides are in an ordinary way broken up in the macerating processes which occur in the ruminants' stomachs, and if not their action on the bowels is helpful in quickly removing the softened indigestible fibrous matter. So that the specific poisonous action is much modified.

The blindness has been experimentally produced by both colocythiin and elaterin, which, in addition to their irritating action on the mucous membrane of the bowels, have a similar action on that of the neighbourhood of the eyes, and a specific irritating effect on the retina. Colocythiin, in addition, is known to produce opacity of the cornea and lens, and by one school of medicine is used in the latter condition in the human being. In India similar plants containing this toxic property are a frequent cause of blindness in young cattle.

Treatment is much more effective when of a preventive nature, that is when possible to have the stomach fairly full of digestible food, such as bran and chaff, before horses go on to the melons; but as this is not always possible, curative treatment has to be adopted, and brisk purging with aloes 6 drams to 8 drams, given as physic balls, has been found to have good effect. The action of the aloes is two-fold—it both counteracts the other two glucosides, and hastens the evaenation of the bowels; but as these are in a very excitable condition, it is advisable to give sedatives as well, such as chlorodyne, or, better, chloroform in the way of spirits of chloroform,  $\frac{1}{2}$ oz. to 1oz. This drug has a specific effect in breaking down the glucosides. In addition, local treatment may be adopted to the eyes in the early stages. This consists of a sedative lotion, such as helladonna or laudanum, used as fomentations frequently, or more readily the alkaloids atropine or morphia may be used as ophthalmic tabloids, inserted under the eyelids two or three times daily, till the acute symptoms have passed, and then the daily application of a lotion consisting of 2gr. of nitrate of silver to the ounce of distilled water, a few drops of the lotion being syringed into the eyes. An after course of 10 drops tr. nux vomica in a little honey on the tongue morning and evening for a week is beneficial.

## EXPERIMENTAL FARM HARVEST REPORTS.

By W. J. SPAFFORD, Superintendent Experimental Work.

### 3.—BOOBOROWIE EXPERIMENTAL FARM.

Manager: Mr. F. E. Waddy.

This farm is situated 120 miles north of Adelaide, and contains 1,344 acres and has an altitude of 1,200ft. to 2,000ft. It consists of two blocks, one, the old North Booborowie homestead, is "high" land running to the highest point in Brown's Hill Range, and contains 1,046 acres; the other block (No. 478) contains 298 acres of comparatively level land, which, in times of heavy rains, is flooded by the Tunela Creek, and is two miles from the homestead. This farm is situated in the centre of a very good district, which contains land suitable for cereal-growing, lucerne-growing without artificial irrigation, and really good grazing land not arable. Unfortunately, this farm does not include any of the first-class lucerne-growing land, of which many thousands of acres are to be found in the district, and as the raising of lucerne under these conditions is as yet in its infancy, possibly useful experiments in this particular line are impossible to us for the want of some of this land.

#### THE SEASON 1916.

The year opened with but little rain, the first four months only producing 1.12in., while the average for the period at this farm is 2.71in. The scarcity of rain in the early part of the year was very soon made up, however, as May gave 1.62in., which is a little above the average, and this put the soil into good seedling condition: June yielded 4.01in., with the average at 2.55in.; July, 3.36in. against 1.96in.; and August 4.42in., when the average is but 1.95in. The period June-August totalled 11.79in., whereas the average for that period is only 6.46in.; and for the first eight months of the year 14.54in. were recorded, compared to 10.63in. average for the period. During September the rain eased, and only 1.86in. fell, whilst the average is 2.20in. This steady-ing up was a great advantage to crops, as in many places the land had been more or less waterlogged for three months, and it now had its chance to drain and become warm. During October and November a large amount of rain, comparatively to the average for these two months, fell, 4.42in. being recorded as against 2.72in. for the average. December also exceeded the average very considerably, and brought the total for the year up to 22.41in., whilst the average is but 16.42in.,

and not only was the total fall high, but 90 per cent. of it was "useful" rain (April-November), when the average percentage of "useful" to total rain at this farm is 84 per cent. The table following sets out in detail the monthly falls seenred at this farm, together with the means since 1900:—

*Rainfall Distribution at Booborowie, 1900-1916.*

	Means, 1900- 1909.								Means, 1900- 1916.	
	1910.	1911.	1912.	1913.	1914.	1915.	1916.	In.	In.	
January .....	0.55	0.33	0.38	0.19	0.06	0.21	0.49	0.31	0.44	
February .....	0.48	0.03	1.26	0.81	0.35	0.07	—	0.04	0.43	
March .....	0.52	4.00	0.73	0.67	2.96	0.11	—	0.19	0.82	
April .....	1.42	—	0.15	0.07	0.07	0.67	1.59	0.58	1.02	
May .....	1.49	1.84	2.20	0.21	0.27	1.34	2.37	1.63	1.46	
June .....	2.64	1.89	2.92	3.42	0.73	0.51	3.40	4.01	2.55	
July .....	1.92	3.13	2.10	2.11	0.83	1.13	1.56	3.36	1.96	
August .....	1.92	1.25	0.73	2.22	2.99	0.10	2.22	4.42	1.95	
September .....	2.06	4.37	1.59	1.89	3.32	0.45	3.34	1.86	2.20	
October .....	1.74	1.72	0.81	1.11	1.66	0.45	1.22	2.41	1.53	
November .....	0.95	1.08	0.24	2.17	0.99	3.14	0.25	2.01	1.14	
December .....	0.69	0.61	2.30	0.63	0.84	1.55	0.70	1.59	0.89	
Total .....	16.37	20.25	15.41	15.50	15.07	9.78	17.14	22.41	16.42	
Total "Useful" rain (April-November)	14.14	15.28	10.74	13.20	10.86	7.79	15.95	20.28	13.85	

#### DISTRIBUTION OF "USEFUL" RAINFALL.

The total rain that falls in a year influences crops grown, but in this direction the "useful" rain (April to November) plays a greater part, and still more so does the distribution of this rain. For the purpose of clearly seeing the distribution of the "useful" rainfall, the season is divided into four periods—seedling, winter, spring, and early summer—and the rainfall for each of these periods shown. In the following table the distribution of the "useful" rainfall on the above plan will be found, together with the means since 1900:—

*Distribution of "Useful" Rainfall at Booborowie, 1916, with Means since 1900.*

	1916.	Means, 1900-1916.
	In.	In.
Seedling rains (April-May) .....	2.21	2.48
Winter rains (June-July) .....	7.37	4.51
Spring rains (August-October) .....	8.69	5.73
Early summer rains (November) .....	2.01	1.14
Total "Useful" rain .....	20.28	13.86

The above table shows seedling rains to be just about average at 2.21in.; the winter rains, with 7.37in., are much in excess of the

average for the farm; so also are spring rains, with 8.69in. Provided that some rain falls in November, it is the quantity of rain distributed over the first three periods that mainly affects crops, so that big rains in early summer are not wanted. This year 2in. fell, as against the average of a little over 1in. With a rainfall distribution as shown at this farm, it would be almost impossible to get other than heavy crops with the ordinary South Australian farming practice. The seeding rains were good, and not too heavy, thus giving every chance to kill weeds, and to germinate well all seed put in during the period. The winter rains were on the heavy side, and consequently delayed seeding, but being plentiful, assured growth to crops in places not liable to becoming waterlogged. Spring rains were again heavy, and so safeguarded all late-sown crops, and tended generally to produce much growth. These spring rains were accompanied by exceptionally cool weather, and were followed by heavy early summer rains and more cool weather, with the result that all crops were very coarse and rank. This would have been all right had we experienced ordinary summer weather from then on; but it was not to be, for in December more rain fell, accompanied by cool weather and heavy winds, with the inevitable result on heavy crops—most of them lodged, some until they were flat, and others shelled their grain very badly. The continued rains and the cool weather delayed the ripening of all the varieties, and interfered with harvesting operations to such an extent that quite half of the grain of some varieties was lost through lodging and shelling. Despite the harvest troubles, the past season easily proved a record for this farm.

#### CROPS.

Other than in the rotation experimental plots, and some mustard, the only crops grown consisted of the cereals, of which some were used for hay.

*Mustard.*—In field No. 5 about 16 acres were ploughed by July 6th and worked down, and on July 7th 5lbs. of white mustard seed was broadcasted to the acre and harrowed in. This crop, owing to the excessive wet and cold, did not make remarkable growth, and the whole area only carried sheep equivalent to 5,348 sheep-days, or 324 $\frac{1}{4}$  sheep-days to the acre, which is less than one sheep to the acre for the year—a very poor return for a sown crop.

*Hay Crops.*—Both wheat and oats were grown for hay. In field No. 1, which carried wheat in 1915, and which was ploughed and cultivated during May 10th to May 16th, and harrowed from May 13th to May 17th, a piece of the block was rolled on May 16th. Between May 13th and May 17th about 21 acres were drilled in with Caleutta

oats—about 3 acres at 82lbs. seed per acre, and 18 acres at 75lbs. per acre—and 1ewt. superphosphate per acre. The whole of the area was harrowed after seeding.

The block of these oats was cut for hay, and the 21.17 acres cut produced 58 tons 4cwt., for an average of 2 tons 14cwt. 110lbs.

Part of field No. 8 (about  $3\frac{1}{2}$  acres) was ploughed in June, after having carried oats in 1915, cultivated, and harrowed immediately, then seeded with King's Red wheat, at the rate of 96lbs. seed and 1ewt. superphosphate per acre; the piece was then barrowed. The area sown for hay—3.60 acres—gave 9 tons, or an average of 2 tons 10cwt. per acre.

Some 13.16 acres of wheat headlands were cut, and produced 42 tons 10cwt., at an average of 3 tons 4cwt. 66lbs. to the acre. This made the total wheat cut 16.76 acres, which gave 51 tons 10cwt., for an average of 3 tons 1ewt. 51lbs. to the acre. The hay cut is shown in the following table:—

*Hay Cut, Booborowie, 1916.*

	Area. Acres.	Total Yield.			Yield per Acre.		
		T.	C.	L.	T.	C.	L.
Oaten hay . . . . .	21.17	58	1	0	2	14	110
Wheaten hay . . . . .	16.76	51	10	0	3	1	51
Total hay cut . . . . .	37.93	109	14	0	2	17	94

The hay returns obtained at this farm have been kept since 1912, and in the table below these will be found, with the mean yield for the period 1912-1916:—

*Hay Returns, Booborowie, 1912-1916.*

Year	Total Rainfall.		Area Acres.	Total Yield.			Yield per Acre.
	In.	"Useful" In.		T.	C.	L.	
1912 . . . . .	15.50	13.20	70.00	132	5	0	1 18 88
1913 . . . . .	15.97	10.86	76.00	109	14	0	1 8 97
1914 . . . . .	9.76	7.79	—	Failure			—
1915 . . . . .	17.14	15.95	52.27	141	15	0	2 15 45
1916 . . . . .	22.41	20.28	37.93	109	14	0	2 17 94
Means . . . . .	15.98	13.62	—	—	—	—	1 16 20

*Oat Crops.*—The oats grown in field No. 1 were sown for the double purpose of cutting for hay or leaving for grain; as things turned out, the whole of it was cut for hay. This proceeding only left for grain oats that were sown on experimental plots. Of these, Scotch Grey oats from .875 acres yielded at the rate of 49bush. 21lbs., and Calcutta oats from 3.352 acres at the rate of 28bush. 20lbs. These together make a total of 138bush. 33lbs. harvested from 4.23 acres for an average yield of 32bush. 33lbs. to the acre.

The oat yields received at this farm since 1913 are to be found in the table below:—

*Oat Returns, Booborocie, 1913-1916.*

Year.	Total Rainfall.		"Useful" Rainfall.		Area, Acres.	Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
	In.	In.	In.	Acres.			
1913 . . . . .	15.07	19.86	54.00		1,394	13	32 11
1914 . . . . .	9.76	7.79	—				—
1915 . . . . .	17.14	15.95	75.47		2,410	20	31 38
1916 . . . . .	22.41	20.28	4.23		138	33	32 33
Means . . . . .	16.09	17.72	—		—	—	24 10

*Barley Crops.*—Field No. 8 carried a crop of oats in 1915, and was ploughed from June 13th to June 19th, and harrowed from June 16th to June 19th in front of the drill. From June 16th to June 19th Cape barley was drilled in on 33½ acres of this field, at the rate of 60lbs. seed with 1ewt. superphosphate to the acre, and the whole block was immediately harrowed. Good weather was experienced whilst this field was being seeded, and rain fell shortly after the operations were completed. Of this block 31.77 acres were harvested for grain, and produced 930bush. 10lbs. for an average of 30bush. 43lbs. per acre. Besides this block 4.155 acres of six-rowed barley were harvested for grain from experimental plots for a total yield of 139bush. 36lbs. and an average of 33bush. 31lbs. per acre. The total barley collected was 1,119bush. 46lbs. from 35.93 acres, and averaged 31bush. 8lbs. Last year (1915) was the first time that barley was grown for grain, and the following table shows the yields for the two seasons:—

*Barley Returns, Booborocie, 1915-1916.*

Year.	Total Rainfall.		"Useful" Rainfall.		Area, Acres.	Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
	In.	In.	In.	Acres.			
1915 . . . . .	17.14	15.95	—	3.09	108	26	35 6
1916 . . . . .	22.41	20.28	—	35.93	1,119	46	31 8
Means . . . . .	19.77	18.11	—	—	—	—	33 7

*Wheat Crops.*—A number of varieties of wheats were grown for grain this year, and in every case were sown on well-worked fallow land. The great majority of the wheats were grown in field No. 13, which carried its last crop of wheat in 1913, and was left in pasture in 1914. The ploughing of the field was done from July 16th to September 17th, 1915: it was cultivated from October 7th to October 19th; again from October 25th to November 5th; again from March 23rd to April 6th; and finally from May 25th to June 6th. The whole field was harrowed immediately after seeding the varieties with the drill, which was commenced on May 25th with Yandilla King, and

completed on June 6th with King's Red. The seed used to the acre varied from 65lbs. to 76lbs., but all wheat was sown with 1cwt. superphosphate to the acre. The only two varieties grown under field conditions away from field No. 13 were Queen Fan and Onas. These were sown in field No. 7, which was ploughed in the period July 6th to July 15th; cultivated from September 24th to October 2nd; from November 1st to November 7th; and from May 23rd to June 8th. It was harrowed soon after first ploughed—from July 23rd to July 24th, and again straight after seeding operations. Part of the Queen Fan—about  $10\frac{1}{2}$  acres—was drilled in on May 24th, and the Onas and the remainder of the Queen Fan—about 14 acres—was seeded on June 9th, 1cwt. superphosphate to the acre being used in each case. The yields obtained from the wheat varieties is shown in the table following:—

*Wheat Variety Yields, Boorooroo, 1916.*

	Area. Acre.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Federation . . . . .	32.71	1,532 43	46 51
Yandilla King . . . . .	34.25	1,259 25	36 46
Onas (No. 7) . . . . .	1.15	41 17	35 54
Marshall's No. 3 . . . . .	26.16	844 0	32 16
Queen Fan (No. 7) . . . . .	21.34	657 36	30 49
King's Red . . . . .	15.70	447 41	28 31
Caliph . . . . .	2.78	76 48	27 38
Bearded Guyas . . . . .	6.62	173 3	26 8
King's Red (Selection 7) . . . . .	2.80	69 51	24 57
Queen Fan . . . . .	2.70	46 19	17 9
Basil . . . . .	2.70	43 29	16 6
Glyyas . . . . .	2.78	42 31	15 19
College Eclipse . . . . .	2.60	33 28	12 52
Late Guyas . . . . .	3.04	38 21	12 37
 Totals . . . . .	157.33	5,306 35	33 44

The yields shown for the individual varieties is no criterion of how the varieties grew and the grain they produced, but was a very clear demonstration of how poor are our harvesting methods when we have good seasons. For instance, the Queen Fan grown in field No. 13 was much better in length of growth, individual plants, heads, and number of grains in the heads than the Queen Fan in No. 7, and the grain was at least of equal quality; yet the block grown in field No. 7, because it stood up a bit better than the other, yielded 30 $\frac{1}{2}$ bush., whilst the better plot in every way gave only 17bush. This applies to all of the varieties more or less, and because of faulty harvesting methods the average yield of the varieties was 33 $\frac{1}{2}$ bush., when it should have been at least 50bush. The above was so practically all over the State.

and although the wheat average reached 15.85bush. to the acre, with better harvesting methods it would have been much nearer 25bush. to the acre.

To the above wheat must be added that obtained from the experimental plots, to show the farm average for wheat for the season, and this is set out below:—

*Wheat Average, Booborowie, 1916.*

	Area.	Total Yield.	Yield
	Acres.	Bush. lbs.	Bush. lbs.
Varieties . . . . .	157.33	5,366 35	33 44
Experimental plots . . . . .	59.34	2,362 5	39 48
Farm average . . . . .	216.67	7,668 40	35 24

This average yield of 35bush. 24lbs. is grand, considering the number of varieties grown, and is by a long way the record this farm has collected, being 8bush. higher than the previous record obtained last year, and almost 14bush. above the farm average. The data leading to the farm average for wheat from 1912 is shown below in the next table:—

*Wheat Returns, Booborowie, 1912-1916.*

Year.	Total Rainfall.	"Useful"		Area.	Total Yield.	Yield
		In.	In.			
1912 . . . . .	15.50	13.20	180.00	4,645 20	25 48	
1913 . . . . .	15.07	10.86	388.75	6,611 53	17 0	
1914 . . . . .	9.76	7.79	330.75	990 58	2 55	
1915 . . . . .	17.14	15.95	284.28	7,765 2	27 19	
1916 . . . . .	22.41	20.28	216.67	7,668 40	35 24	
Means . . . . .	15.98	13.62	—	—	21 41	

The yields obtained from the various varieties have been kept since 1913, and in the following table the behaviour of the main varieties is set out:—

*Yields of Wheat Varieties, Booborowie, 1913-1916.*

Varieties.	1913.	1914.	1915.	1916.	1913-1916.
	Bush. lbs.				
Federation . . . . .	26 53	3 43	33 33	46 51	27 45
Yandilla King . . . . .	20 36	1 33	27 55	36 46	21 42
King's Red . . . . .	21 49	2 34	28 44	27 53	20 46
Marshall's No. 3 . . . . .	19 16	2 0	25 50	32 16	19 50
Gluyas . . . . .	18 2	3 16	27 18	15 19	15 59
Queen Fan . . . . .	—	—	35 46	29 17	—
Bearded Gluyas . . . . .	—	—	29 28	26 8	—
Farm averages . . . . .	17 6	2 55	27 19	35 24	20 39
Total rainfall . . . . .	15.07in.	9.76in.	17.14in.	22.41in.	16.09in.
"Useful" rainfall . . . . .	10.86in.	7.79in.	15.95in.	20.28in.	13.72in.

*EXPERIMENTAL PLOTS.*

In 1915 a block of land was divided up into several series of rotation plots, and as only two crops have been grown on these plots, the

returns are little more than yields of cereals with dressings of superphosphate. Below will be found the results obtained from these plots during 1915 and 1916:—

*Rotation Plots, Booborowie, 1915-1916.*

Plot.	1915 Treatment.	1916 Treatment.	Wheat		Mean Yield per Acre.
			per Acre.	B. lbs.	
SERIES I.					
1	Bare fallow.....	Wheat : 2ewts. super. ....	30	28	—
2	Wheat : 2ewts. super. ....	Bare fallow.....	29	42	30 5
SERIES II.					
3	Sorghum .....	Wheat : 2ewts. super. ....	31	20	—
4	Wheat : 2ewts. super. ....	Sorghum .....	34	44	33 2
SERIES III.					
A.					
5	Bare fallow.....	Wheat without manure ...	28	45	
6	Wheat without manure ...	Pasture .....	29	5	
7	Pasture .....	Bare fallow.....	—	28	55
B.					
8	Bare fallow.....	Wheat : 1cwt. super. ....	37	47	
9	Wheat : 1cwt. super. ....	Pasture .....	37	9	
10	Pasture .....	Bare fallow.....	—	37	28
C.					
11	Bare fallow.....	Wheat : 1cwt. super. ....	30	17	
12	Wheat : 1cwt. super. ....	Pasture .....	38	51	
13	Pasture .....	Bare fallow.....	—	39	4
D.					
14	Bare fallow.....	Wheat : 2ewts. super. ....	39	30	
15	Wheat : 2ewts. super. ....	Pasture .....	37	6	
16	Pasture .....	Bare fallow.....	—	38	18
E.					
17	Bare fallow.....	Wheat : 3ewts. super. ....	40	0	
18	Wheat : 3ewts. super. ....	Pasture .....	39	40	
19	Pasture .....	Bare fallow.....	—	30	50
SERIES IV.					
A.					
20	Bare fallow.....	Wheat : 2ewts. super. ....	43	40	
21	Wheat : 2ewts. super. ....	Barley : 1cwt. super. ....	37	37	
22	Barley : 1cwt. super. ....	Bare fallow.....	—	40	38
B.					
23	Bare fallow.....	Wheat : 2ewts. super. ....	42	25	
24	Wheat : 2ewts. super. ....	Oats : 1cwt. super. ....	31	0	
25	Oats : 1cwt. super. ....	Bare fallow.....	—	38	12
C.					
26	Bare fallow.....	Wheat : 2ewts. super. ....	42	41	
27	Wheat : 2ewts. super. ....	Pearl : 1cwt. super. ....	36	24	
28	Pearl : 1cwt. super. ....	Bare fallow.....	—	39	32

*Rotation Plots, Booborowie, 1915-1916—continued.*

Plot.	1915 Treatment.	1916 Treatment.	Wheat per Acre.	Mean Yield per Acre.
SERIES IV.				
D.				
29	Bare fallow.....	Wheat : 2cmts. super. ....	44	54
30	Wheat : 2cmts. super. ....	Rape : 1cwt. super. ....	31	52
31	Rape : 1cwt. super. ....	Bare fallow.....	—	38 23
SERIES V.				
32	Bare fallow.....	Wheat : 2cmts. super. ....	44	47
33	Wheat : 2cmts. super. ....	Bare fallow.....	34	52 39 49
SERIES VI.				
A.				
34	Bare fallow.....	Wheat : 2cmts. super. ....	49	5
35	Wheat : 2cmts. super. ....	Barley : 2cmts. super. ....	35	1
36	Barley : 2cmts. super. ....	Pasture .....	—	—
37	Pasture .....	Bare fallow.....	—	42 3
B.				
38	Bare fallow.....	Wheat : 2cmts. super. ....	48	42
39	Wheat : 2cmts. super. ....	Oats : 2cmts. super. ....	35	49
40	Oats : 2cmts. super. ....	Pasture .....	—	—
41	Pasture .....	Bare fallow.....	—	42 15
SERIES VII.				
42	Bare fallow.....	Wheat and lucerne : 2cmts. super.	33	47
43	Wheat and lucerne : 2cmts. super.	Lucerne .....	33	37
44	Lucerne .....	Lucerne .....	—	—
45	Lucerne .....	Lucerne .....	—	33 42
46	Lucerne .....	Bare fallow.....	—	—
SERIES VIII.				
47	Bare fallow.....	Wheat and Rye Grass : 2cmts. super.	47	30
48	Wheat and Rye Grass : 2cmts. super.	Rye Grass .....	22	0
49	Rye Grass .....	Rye Grass .....	—	—
50	Rye Grass .....	Bare fallow.....	—	34 45

*Crops other than Wheat in Rotation Plots.*

	1915. Yield per Acre. Bush. lbs.	1916. Yield per Acre. Bush. lbs.	Mean Yield per Acre. Bush. lbs.
SERIES IV., A—			
Barley : 1cwt. super. ....	27 47	26 27	27 12
SERIES IV., B—			
Oats : 1cwt. super. ....	31 9	33 23	32 16
SERIES VI., A—			
Barley : 2cmts. super. ....	41 7	34 16	37 36
SERIES VI., B.			
Oats : 2cmts. super. ....	40 20	23 5	31 32

## SERIES IV. C.—

Peas;  $\frac{1}{2}$ cwt. superphosphate. In 1915 this crop was harvested for grain, and produced 12bush. 42lbs. to the acre, but in 1916 it was fed off by sheep, with the following result:—From December 11th to 22nd a flock of 146 ewes were on plot, and the same flock again from December 25th to 27th, making a total of 1,898 sheep-days for an area of 1.7214 acres, which equals 3.02 sheep per acre for 365 days.

## SERIES IV. D.—

Rape;  $\frac{1}{2}$ cwt. superphosphate. Both in 1915 and 1916 this crop was fed down by sheep, with the following results:—

1915—From October 5th to 13th, 100 sheep; October 16th to 22nd, 507 sheep; December 15th to 17th, 350 sheep, which together equals 4,542 sheep-days for 1.7214 acres, or a carrying capacity of 7.23 sheep to the acre for a year.

1916—From October 28th to November 3rd, 240 sheep; December 9th to 15th, 100 sheep; December 29th to January 2nd, 12 sheep, together equaling 2,083 sheep-days for an area of 1.7214 acres, or 3.32 sheep to the acre for the year.

## SERIES VII.—

Wheat with lucerne and 2ewts. superphosphate. The grazing of the plot sown as above in 1915 was done at one period with a flock of 110 sheep, from November 7th to 18th, which is 1,210 sheep-days on 1.6912 acres, and is equivalent to 1.96 sheep per acre for the year.

## SERIES VIII.—

Wheat with rye grass and 2ewts. superphosphate. The grazing of the plot sown as above in 1915 was as follows:—50 sheep from October 5th to 7th; 200 sheep from October 9th to 10th; 150 sheep from October 17th to 19th; 110 sheep from November 3rd to 4th, making a total of 710 sheep-days on 1.6912 acres, and equal to 1.15 sheep per acre for the year.

## Seed in Rotation Plots, 1916.

Wheat—Federation	75lbs per acre
Barley—Cape	58lbs. per acre
Oats—Caledonia	75lbs. per acre
Peas—Early Dun	100lbs. per acre
Rape—Dwarf Essex	44lbs. per acre
Lucerne—Hunter River	61bs. per acre
Rye Grass—Italian	91bs. per acre
Sorghum—Early Amber Cane	71bs. per acre

## PERMANENT MANURIAL PLOTS, BOOBOROWIE, 1916.

In 1915 a set of permanent manurial plots were surveyed, so that the experiments will be conducted on the bare fallow-wheat system, and one part was worked as bare fallow that year and cropped this year, whilst the other portion was bare-fallowed in 1916. Federation wheat was used in all cases, and the results obtained, although only for a single season, are comparable one with the other for the particular conditions that obtained.

Plot.	Manuring per Acre.	Grain per Acre.
		Bush. lbs.
1. $\frac{1}{2}$ cwt. superphosphate	...	36 58
2. 1ewt. superphosphate	...	38 57
3. 2ewts. superphosphate	...	39 3
4. 3ewts. superphosphate	...	38 0
5. No manure	...	32 58
6. 1ewt. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda (spring)	...	40 18
7. 2ewts. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda (spring)	...	40 50

PERMANENT MANURIAL PLOTS, BOOBOROWIE, 1916—*continued.*

Plot.	Manuring per Acre.	Grain per Acre.
		Bush. lbs.
8.	1ewt. superphosphate, 1ewt. sulphate of ammonia (seeding) ..	41 25
9.	2ewts. superphosphate, 1ewt. sulphate of ammonia (seeding) ..	38 11
10.	1ewt. superphosphate, 1ewt. sulphate of potash (seeding) ..	10 50
11.	2ewts. superphosphate, 1ewt. sulphate of potash (seeding) ..	44 1
12.	2ewts. superphosphate, 1ewt. sulphate of potash (seeding), 1ewt. nitrate of soda (spring) ..	40 34
13.	1ewt. superphosphate ..	40 11
14.	No manure ..	40 9
15.	1ewt. basic slag ..	41 55
16.	2ewts. basic slag ..	42 23
17.	10 tons farmyard manure ..	40 7
18.	10 tons farmyard manure, 2ewts. superphosphate ..	41 44
19.	10 tons farmyard manure, 2ewts. superphosphate, 1ewt. sulphate of potash ..	42 5
20.	2ewts. superphosphate, 4ewts. gypsum ..	41 8
21.	2ewts. superphosphate, 5ewts. lime ..	45 58
22.	2ewts. superphosphate (half at ploughing) ..	40 40
23.	2ewts. superphosphate (half at ploughing), 1ewt. nitrate of soda	41 31

## PERMANENT CULTIVATION PLOTS, BOOBOROWIE, 1916.

In 1915 a series of cultivation plots, having as their object different methods of treating bare fallow, were commenced, and they carried their first crops in 1916. They are worked on bare fallow-wheat system, and received 2ewts. superphosphate to the acre. This season they all carried Federation wheat, with the following results:—

Plot.	Treatment.	Yield per Acre.
		Bush. lbs.
<i>Early Fallow (June-July).</i>		
24.	Ploughed 6in. deep and harrowed within a few days. Cultivated or harrowed whenever weeds or a crust render necessary ..	40 48
25.	Ploughed 6in. deep and left rough throughout the winter. Cultivated or harrowed whenever weeds or a crust render necessary ..	41 4
26.	Ploughed 6in. deep and rolled within a few days, and cultivated or harrowed according to circumstances. Cultivated or harrowed whenever weeds or a crust render necessary ..	33 25
27.	Ploughed 6in. deep and skinned ploughed after first rain. Cultivated or harrowed whenever weeds or a crust render necessary ..	41 1
<i>Late Fallow (September).</i>		
28.	Ploughed 3in. deep and cultivated according to requirements, but not rolled ..	35 38
29.	Ploughed 6in. deep and heavily rolled the same day as ploughed. Cultivated according to requirements ..	37 45
<i>Autumn Ploughing (March or April).</i>		
30.	Not bare-fallowed, but ploughed 4in. deep and immediately rolled. Cultivated according to requirements ..	35 49

## PERMANENT DEPTH OF PLOEGGING PLOTS, BOOBOROWIE, 1916.

Besides the above series of cultivation plots, a further series of depth of ploughing plots was started at the same time, on the bare fallow-wheat system, using 2ewts. superphosphate to the acre with the crop. The first crop was grown in 1916, and Federation wheat was used throughout the series.

Plot.	Depth of Ploughing.	Yield per Acre. Bush. lbs.
31.	Ploughed 3in. deep	40 2
32.	Ploughed 6in. deep	37 26
33.	Ploughed 9in. deep	33 54
34.	Ploughed 9in. deep (to be then twice ploughed 3in. before again being ploughed 9in.)	33 44

## CULTIVATION OF GROWING CEREALS EXPERIMENT.

In these experimental plots the cereals wheat, oats, and barley were drilled in rows 21in. apart, and the strips between the rows were kept loose and free from weeds by cultivation. Account was kept of all work done, and the time occupied by each operation, so that the extra cost of the working over and above ordinary farm methods can be found.

## CULTIVATION OF "ROSEWORTHY" WHEAT.

"Roseworthy" wheat was drilled into 1 acre of land in rows 21in. apart; 11lbs. of seed were used to the acre, and 2ewts. superphosphate. This acre plot received two horse-hoeings, one taking 2½ hours and the other 2 hours 20 minutes to do, and hand weeding by one lad for 27 hours. The wheat yielded 31bush. 57lbs. for an extra cost of 16s. 4d. for the acre, arrived at as follows:—1 horse for 1 day, 2s. 6d.; 1 man for 1 day, 9s.; 1 lad for 8 hours, 4s.; less 49lbs. seed at 1d. per lb.

## CULTIVATION OF "SCOTCH GREY" OATS.

"Scotch Grey" oats were drilled into 1 acre of land in rows 21in. apart; 12lbs. of seed were used to the acre, and 2ewts. of superphosphate. This acre plot received two horse-hoeings, one taking 2½ hours and the other 2 hours 10 minutes to do: but no hand-hoeing was found to be necessary. The oats yielded at the rate of 49bush. 21lbs. to the acre for an extra cost of 2s. 8d., worked out on the same basis as above, but being less 48lbs. seed.

## CULTIVATION OF "SHORT HEAD" BARLEY.

"Short Head" barley was drilled into 1 acre of land in rows 21in. apart; 12lbs. of seed were used to the acre, and 2ewts. superphosphate. This acre plot received two horse-hoeings, one taking 2 hours 20 minutes and the other 2 hours 45 minutes; but no hand-hoeing was necessary.

The barley produced 41bush. 36lbs. to the acre for an extra cost of 3s. 4d., worked out on the same basis as for the wheat, but with an allowance for 48lbs. seed saved.

Unfortunately not enough seed of the particular varieties was obtainable at the time to grow check plots of them under ordinary farm conditions. This fault will be corrected in the coming season; but as we were in a position to start these plots, although with a limited amount of seed, we decided it would be better to get them going, instead of losing a year's results.

#### GENERAL.

The manager of the farm (Mr. F. E. Waddy), in his report, states that several heavy frosts, with hot days, occurred during October; but these changed to damp, thundery conditions, and the only noticeable damage done by the frost was to the plot of sorghum, which was cut to the ground and did not recover. The land being in good condition, the crops came away nicely, and made splendid growth throughout the year, and the good spring rains caused the heads to fill well, with the resulting good yield. The yield would have been much higher if all of the wheat could have been gathered, but the rough, stormy weather during the summer knocked the crops about badly; much wheat was shaken out, and a large proportion could not be picked up by the harvesting machines. The fodder crops, rape and peas, made splendid growth; the rape made a poor start, but had wholly recovered by the end of the winter.

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## FRUIT TREES.

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### THE PRINCIPLES OF PRUNING.

The Horticultural Instructor (Mr. Geo. Quinn), at a recent conference of the River Murray Branches of the Agricultural Bureau, delivered an address on the principles of pruning fruit trees.

It was stated that every man had his own methods of pruning, he said, and Professor Bailey had written that no system of pruning could be said to be wholly wrong, and that no system could be claimed to be entirely right. There were two recognised systems of pruning

and training trees, the European and the American. These were two very diverse methods, but so far as they were concerned they could not adopt either of them on account of the cost of labor and the distance from the world's markets. The orchard was the best place to demonstrate pruning, but it was wise at times to resort to the lecture room and there discuss the philosophy of the subject. The idea of pruning was to increase the size and quality of the fruit, to maintain regular crops over a long period, and to accomplish these aims upon economic lines, and he wished to emphasise not to lose the economic side of the question. The commercial side had to be considered. What might be called the philosophy of pruning could be summed up in the accumulated observations of the behaviour of plants when subjected to certain operative treatments under known conditions of soil and climate.

#### THE BASIC PRINCIPLES.

What were the basic principles of pruning? They were founded on a knowledge of certain laws, or effects which almost invariably occurred in the growth of plants. They might summarise them under five points:—(1) The value of foliage to the plant, (2) the advantages accruing to a vertical position, (3) the natural balance between roots and branches, (4) the vigor of vegetation versus fruit production, (5) that large numbers of fruit were incompatible with fine size and quality. Taking the foliage of the trees, it had to be remembered that that was almost equal in value to the stomach and lungs of an animal, and the health and vigor of the tree depended on the spread of healthy foliage on it. Then there were the advantages which accrued to the upright branches which all tended to grow stronger. That was always taken advantage of in pruning, and was a point that could not be lost sight of in the training of the vine. By distributing the principal branches of vines on a trellis a better distribution of the sap was obtained to all parts. The same practice was applied in connection with the growth of apples, in which the weaker trees were trained towards the upright position and the stronger ones in an oblique direction. The relation of the upper parts of the tree to the roots had to be considered, and much trouble had been observed in the Adelaide hills from not recognising the balance between the upper part and the roots of the trees. In planting young trees they had to remember that the gardeners in uprooting the trees from the nursery had probably left two-thirds of the roots in the ground, hence they always cut back the upper portion of the tree after planting. Much vigor of vegetation in a growing plant was usually opposed to a prolific fruiting habit. By means of summer pruning the plant material building facilities were restricted by removing some of the foliage. Hence its effects were deemed conducive to fruit bearing. A large number of fruits was incompatible with large size and good quality, and by thinning off by hand as was done in Europe, a reduction was effected but an increased size obtained. Here we lessened the number of the fruits by cutting off fruit bearing spurs, which thus also tended to increase the size of the fruit. Summer pruning devitalised the tree, and if persisted in to a great extent would ultimately kill the tree.

whereas winter pruning, in conjunction with other operations, would tend to strengthen the trees, more particularly in certain desirable directions. They could not compare the cutting away of tree limbs with the cutting off of limbs of an animal, as an animal could not grow another limb.

#### THE REASON FOR PRUNING.

Why was pruning done at all, it might be asked? Pruning was done to modify the form of the tree to meet economic needs, and to counteract unfavorable climatic conditions, to reduce or stimulate the production of wood growth or fruit bearing as the case demanded, and to remove injured or worn-out parts of the tree. In modifying the form of our fruiting plants we were gradually evolving a type of tree and grapevine adapted to our own conditions. The hotter and the more exposed the position the shorter should they have the stem, so they preferred to have a short stem with stout limbs, and thereby bring the fruit within easy reach, and to shade the ground and protect the tree from high winds. They appeared to be following a slightly different system of pruning on the Murray to that adopted in other parts of Australia. They had erred in the past in the direction which induced trees to produce wood. They should know that by too vigorous a growth they got less fruit, and it became necessary to stunt the tree to obtain blossom and fruit. But if that went too far they had to apply such methods to it as would cause it to grow again. That was what all pruning operations aimed at—the building of the tree so that it would prove of the greatest commercial use. The removal of, and the renewing of worn out parts of trees was given less attention than others. Wounds in trees were frequently seen that were not healing on account of the ends being in a wrong position. It required no more care to make a cut in the right direction and cleanly than it did to hack off a limb. He urged growers to use sharper and better adapted implements for their pruning operations.

#### PRACTICAL SUGGESTIONS.

In the case of spur fruiting types of deciduous trees we had the apple, pear, and plum, and the peach, apricot, and nectarine might be called shoot fruiting trees. In dealing with deciduous trees for the first two or three years the treatment was practically the same, to get a short, stiff trunk from which branches should radiate. Thus they were pruned hard for a few years. It was not necessary, assuming they had a good framework, to keep on cutting, year after year, at the leading shoots. Even in England the length of the shoot varied in regard to what had grown from the last pruning, and what was allowed to remain. The topping of the leader to a dormant bud would tend to draw an undue amount of sap, and the result would be that, as someone had remarked, one might go on growing prime trees for many years and get no prunes. Assuming that a decent framework had been first obtained and it became necessary to cut back, it was not a difficult matter to prune the tree so as to get it to its normal condition. It

was found that the quality of the fruit of the prune tree would deteriorate if they allowed it to become a mass of subdivided laterals. Unless some pruning was done the quality of the fruit declined, and the profit of the grower was consequently reduced. If they could so regulate the trees as to get away from the heavy and light cropping years they would do a great deal. The winter before the heavy crop was anticipated the thinning out should be carried into effect, and not the year before the light crop. That would prevent the tree making undue growth and enable it to return a reasonable amount of fruit and so keep the tree in some form of regularity of growth and bearing. On the river they could get a quicker return than on the colder areas, as the result of the stronger growth induced by increased sun heat. Under such conditions they should prune young trees for two years, and the third year they should be less manipulated with the pruning knife. If they did not desire to let the trees grow weaker they should cut them back again in subsequent years.

#### "THE UNSTOPPED LEADER."

He had in the different settlements found a different interpretation of what was termed the "unstopped" leaders. In some settlements he had seen trees with four spindly limbs each of which was growing heavenwards with all its vigor. If in their early years those trees had been cut for another winter or two they would have had more limbs and would have filled up the spaces which would tend to make the trees more profitable. He felt that the uncut leader was a good idea if applied intelligently. If they left the weak branch uncut and expected to get the same return as from a strong branch uncut, they were deceiving themselves. When the top of a leading shoot was cut to a single dormant bud the first rush of sap was to that bud, or the dormant buds round about received the benefit. If they turned that leader on to a weaker shoot they got as near as they could to prevent the sap going to the stronger shoots to the detriment of the spurs or laterals. In regard to the terminal point there might come a time when they could not permit it to grow vertically. When the trees were becoming retarded to the extent of stunting the fruit they found that it was necessary to cut them back and thereby restore their vigor.

Mr. H. S. Taylor said that he had no desire to criticise Mr. Quinn. He was perfectly satisfied with the unstopped leader, but he was aware that it was a matter which required careful consideration. He was satisfied that Mr. Quinn was right when he urged that it was necessary to prune trees for the first two years.

Mr. Ross said that the tendency seemed to be that the head of the tree became callous, and he thought that under ordinary circumstances it was necessary to move the tree every third year.

Mr. Basey said it was not so much the cutting back of the leader as the turning of it back to the lateral.

## SWINE FEVER.

### ITS CAUSE AND TREATMENT.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), replying to a correspondent who inquired for information as to the symptoms of and treatment for swine fever, states that swine fever, the hog cholera of America, is a specific contagious intestinal fever of swine, having many conditions similar to typhoid fever in man. It is attended by congestion, exudation, blood extravasation, and ulceration of the mucous membrane of the throat, stomach, and bowels, by liquid foetid diarrhoea, by general heat and redness of the surface, and by the appearance on the skin of spots and patches of a scarlet or purple color, and a sealy rash on the thighs and legs. It is either fatal in one to six days, or ends in a slow uncertain recovery. The fatalities are commonest in young pigs of a few months, the so-called recoveries in older pigs resulting in their being "carriers," as in human typhoid. The evacuations emit a very peculiar characteristic odor, very reminiscent of human typhoid.

### SYMPOTMS.

Incubation ranges from a week to two in cold weather to three days in warm. It is followed by shivering, dullness, weakness, hiding under litter (very characteristic), unwillingness to rise, hot dry snout, sunken eyes, unsteady gait behind, little or no appetite, great thirst, fever. The skin is hot and sore, and red or purple patches appear, especially behind the ears, elbows, on thighs: the patches lose their color if pressed, but the spots do not. The tongue is thickly furred, and the squeal weak and hoarse. Breathing quick, with a hard dry cough. The animals may vomit and grunt or squeal if the belly is handled, the bowels may be constipated throughout, but more commonly they become relaxed about the third day, and an exhausting foetid diarrhoea ensues, slime and blood may pass with the dung. The pig loses control of the hind limbs, and is often quite stupid, with muscular trembling, jerking, and involuntary emission of dung and urine.

### CAUSES.

It is due to microbes so small that they are not to be seen even with a most powerful microscope, and hence called ultravisable. But faults in feeding and management help to bring it about. The microbes may be blown half a mile by the wind, and carried by dogs, birds, rats, and especially on boots of attendants or visitors, who should be rigorously excluded from the premises or made to disinfect their boots before leaving. It is very difficult to destroy in sties, bedding, &c., fire being the only reliable means of so doing.

### TREATMENT.

Treatment is not permissible in South Australia, and the owner of suspected pigs is required by the Stock Diseases Act, under severe

penalties, to at once isolate such animals, and give immediate notice to the Chief Inspector of Stock, Adelaide, and the nearest inspector to the premises. It is the height of folly to attempt to evade these regulations, as the immediate detection of the disease is the only way of effectually checking it, and the symptoms are so varied, and in many cases so slight, that only the trained eye can detect them. Delay in reporting may lead to a large outbreak, which in the present promising state of pig breeding would lead to disaster. Delay is unneighbourly and worse than a crime; it is foolish in the extreme. The officers of the Stock Department do not go about seeking to discover swine fever where it does not exist; they are only too delighted to find a call proves a false alarm. In America, Holland, and Austria preventive and curative treatment is carried out by means of sera under qualified veterinary surgeons, and the same course has been very successfully tentatively adopted in Great Britain. The administration of calomel in 15-grain to 60-grain doses assists; this latter may be given before the inspector arrives, and a few drops of sulphuric acid may be added to fresh, cool drinking water.

#### PREVENTION.

The pig is the cleanest and most sanitary of all domesticated animals when given a fair chance, and all newly bought pigs should be placed at a safe distance in quarantine for three weeks until their good health is proved. Food should be clean and good; cinders, charcoal, or slag should always be available for pigs, and an occasional ounce of photographers' hypo. in their slop will do good. If at all costive, give sulphur in their feed; from a teaspoon to a dessertspoon daily for a few days is advisable.

Should a pig show any of the above symptoms, isolate it at once, and kill it if decided symptoms set in.

Kill and bury in lime and disinfectants all diseased ones, and watch survivors for any symptoms that may develop. Thoroughly disinfect all material they may have come in contact with, and avoid all suspected food, places, or even water that has run near a diseased herd.

Remember the provisions of the Stock Diseases Act and your duty under it.

The Veterinary Lecturer is an officer of the Agricultural Department, not of the Stock Department, and though he is always ready to offer advice, fatal delay may arise if you fail to immediately inform the Chief Inspector of Stock, Adelaide.

Swine fever can be kept out of South Australia, and the way to do it is to co-operate heartily with the Stock Department, whose officers are your friends, and more anxious to keep your pigs free from disease than many pigowners; it is of no monetary advantage to them, while concealment may mean the ruination of an industry that is likely to be one of the farmers' best assets.

## SPRAY IRRIGATION.

### EXPERIENCE AT PYAP.

Mr. G. Beverley (manager of the Pyap Estate, and a member of the Loxton Branch), at the recent Conference of River Murray Branches of the Agricultural Bureau contributed the following paper, giving the results of his experience with a system of spraying for irrigation purposes, which had been installed at Pyap. The paper read—

After over 20 years of practical work with irrigation of various methods, I can confidently recommend spray irrigation as superior to any I have had experience with.

In the first place the great benefit derived by the use of the spray system since its installation at the Pyap Estate has been amply demonstrated by its use on a citrus patch planted on a high slope of land which formerly was watered only by the furrow system of irrigation, with the result that in irrigating by the latter method the trees were after three years from the time of planting no larger or better grown than trees that have only been 12 months planted and have been watered with the spray irrigation. Two patches of citrus planted at the same time on opposite sides of the road, were chosen as giving a good chance to fully demonstrate the advantages claimed for this spray system over the furrow irrigation. Both pieces of land were on a slope of the same grade, the soil was exactly similar, and the variety of citrus planted, viz., navel orange on Seville stock, were chosen as giving a perfectly equal chance to demonstrate both sides of this question. After 18 months' use of the spray on the one patch before mentioned the trees had gained fully two years' growth over those watered by the old method, which were very little better than they were 18 months previously. The spray patch, although it had been watered with water that was very salty, owing to the low river prevailing at the time, still showed healthy growth, and was carrying a good crop of oranges, while the other patch was yellow and sickly, and did not show a single fruit.

### SPECIAL ADVANTAGES CLAIMED.

The beneficial result is easily explained by the fact that the spray system takes only one-sixth of the water required, and gives a better result than the larger quantities used by furrow irrigation, consequently, the furrow method gave a considerable deposit of salt to the roots of the trees, hence their sickly appearance. The principal advantages of the spray system are:—(1) Economy in water, only one-sixth of the water used by the furrow system being required to give a better result, for the reason that there is little or no evaporation as in open channels, and unless the channels are concrete lined there is also the great loss by soakage to contend with. (2) The water distributed in the form of a fine mist pre-cools the atmosphere, so that the spray may be used on even young and delicate trees with impunity during the

hottest part of the day. (3) The water is evenly distributed over the whole surface of the land and no flooding is caused. (4) By the spray system it is possible to bring into cultivation land of so steep a grade that it would be impossible to water by any other means, and thus hundreds of acres along the river of splendid land, too steep in the grade, or undulating, to be irrigated by ordinary methods could be sown with lucerne and watered by the spray system with gratifying results to the owners.

#### ECONOMY OF THE SYSTEM.

It is claimed by those who deprecate this system that the initial cost is too high, but I am sure that, if everything was taken into account, the installation from the start of the spray system would compare favorably with the old furrow or flooding methods on these grounds: (1) Economy in the size of the pump required. (2) Entire saving of the grading of the land, which necessitates the removing of the best top soil and placing it on the top of already rich soil, to the detriment of the land from which it was removed. (3) Even distribution of water. (4) Entire absence of flooding, so annoying to settlers who have depressions in their land which hold the water, thus often preventing the prompt cultivation of the land, so necessary to insure good healthy growth. (5) The spray system is the nearest approach to natural rainfall that it is possible to obtain, and I think that no one will deny that any trees grown under natural conditions will be healthier than those grown otherwise.

The leaves and limbs of the trees are washed free of dust, and the bark is kept from becoming hidebound, as it often does in trees that are checked or stunted in their growth. In the case of manure having been applied to any patch of land the water falling in the shape of rain, leaches the manure through the soil, dissolving it gradually, whereas the furrow system will, in many cases, especially on sandy soil, wash the top soil and manure to the bottom of the rows of trees or vines, thus giving the plants at the lower end of the slope a larger share than is required, while those at the top end are often deprived of the manure they need. This is entirely obviated by watering with an evenly distributing spray.

#### LUCERNE GROWING.

With respect to lucerne grown under the spray, I cannot give much data on this, as the 16 acres that were sown to lucerne on the estate were flooded out by the high river, with the exception of a patch about one acre in extent. This patch, sown on October 12th, 1916, gave four cuttings of lucerne up to the end of March, 1917, and a fifth cutting when about a foot high was eaten down by sheep. It is claimed, however, by those who have installed the spray system for lucerne that two more cuttings per annum can be reckoned on than on patches that are flooded, but of this I cannot speak with authority. There is also to be borne in mind the saving in land occupied by channels; and the cost of concreting same, and the saving in the cost of labor for watering.

## THE DRYING OF FRUIT.

### METHODS ADOPTED ON MURRAY SETTLEMENTS.

After dealing briefly with the history of the fruit-drying industry, Mr. W. R. Lewis, of the Berri Branch, in a paper read before the Murray River Branches of the Agricultural Bureau Conference, stated that the drying of fruit might be summed up in three words—evaporation by heat. “Of the best method of applying that heat,” the paper continued, “very much might be said. Some may advocate an evaporator, where the drying may be accomplished in a very short time. Of these drying kilns or evaporators, quite a variety exist, and some good fruit has been so dried; but they require a considerable amount of attention, and on the whole do not turn out a fruit equal to the sun-dried article. So I think, at least as far as this valley of the Murray is concerned, except in special seasons, we may dismiss the evaporator as not being the best for our purpose. The outfit first introduced by the Chaffey Bros. was, so far as stone fruit was concerned, a quantity of wooden trays, 3ft. by 2ft., with sulphur boxes or houses, according to quantity of fruit to be handled. Since then alterations have taken place in the size of trays used, but the principle remains the same. In dealing with the fruit of the vine, however, alterations of considerable importance have been made. In the earlier days practically the whole of the fruit was dried on the small wooden trays. Now we see large racks composed of netted wire and timber being used, and it is safe to say that by far the larger portion of currants, with considerable quantities of sultanas and Gordos, are now dried upon racks and wire trays. Now, upon drying matters, perhaps if I start with the apricot and just outline the procedure, it may be of some service to those who have had practically no experience.

### PRELIMINARY WORK.

“In selecting your drying ground, you have a number of factors to take into consideration; among others, convenience of working and liability to dust have to be considered. Do not underrate the dust, for many a sample of fruit, otherwise good, is seriously damaged by dust. For apricot drying, I certainly prefer a closely cut lucerne plot; it may dry a little slower than bare earth, but the dust trouble is reduced. Two sulphur boxes, or more if you have a large quantity to handle, and a sufficient quantity of trays are required. The fruit must be ripe or you cannot get a good color. It should not be too soft to handle, but quite ripe. Cut clean round your fruit, not half-way, otherwise you force the stone out; if you do, you have a ragged edge that will look bad when dried, and also in sulphuring you will be liable to lose juice set free by the action of sulphur, and juice running on to your trays is, of course wasted: and so you lose in weight and in appearance. Place your cut fruit on the tray as evenly as possible, and do not allow it to list, or you may lose juice by this. Do not expose the cut fruit to the hot sun before sulphuring—keep it covered. Place it in the sulphur box and sulphur for at least four hours—all

night will not hurt it unless the weather is particularly hot. Make sure that your sulphur is well alight before closing down. It is a good plan to have a small opening at the top of the box to allow the escape of air until well alight, when it can be closed. About 2lbs. of sulphur should do 100 small trays; but I would not stint sulphur, as it is not likely to do any injury, and it fixes the color, and appearance tells in the selling of dried fruit as well as it does in fresh. The time on the drying ground is, of course, governed by the weather, but if the heat reached, say, above 95deg. in the shade, I would stack and finish off in the shade. If the picking is done by your own family, you may arrange to do most of your grading in the orchard whilst picking, as it saves time on the drying ground—a matter of expense if you are employing labor.

#### CARE NEEDED.

"Apricots, to be dried whole, require to be well sulphured; care is needed in putting them out, as they have a tendency to blister if placed in the sun at too great a temperature. It must be borne in mind that whole apricots will take very much longer than cut ones to dry, so if you have a shortage of trays, you will not gain much by trying whole apricots; but if you have the material, it is a way of disposing of a lot of fruit in quick time, but I do not recommend it. The method of treating peaches and nectarines is similar. Goldmine nectarines may be safely dried whole, and I fancy retain their flavor better when so done; but I could not recommend the drying of peaches whole. A tendency to mould round the stone seems to be the chief trouble. Sulphur whole nectarines heavily. Some American authorities, in dealing with peaches, sulphur them for one hour. This loosens the outer skin, which is then removed. The peaches are then re-sulphured to fix the color, then dried in the ordinary method; and it is in California that they should know something of peach drying. Before dealing with the currants, I should like to say a few words about the prune and fig.

#### PRUNE GROWING.

"So far we have not had much to encourage us to go in for prune growing. But the fact that some men are making the prune pay ought to encourage us to at least keep on experimenting, if only on a small scale. The prune is a most popular fruit, and vast quantities are yearly consumed. In our own colonies quantities are imported, and I certainly think, we ought to be able to stop this. Some fine samples of prunes are yearly grown by Mr. Faulkner, of Mildura, whose method of procedure may be worth noting. He claims that his best results are obtained by prickling, and when nearly dry, plunging into boiling water, to wash the fruit clean; then immediately dip in a light syrup, then for a few hours spread on trays to dry, when they are ready for packing. In California the prunes are usually shaken from the trees. On the drying ground they are placed in dipping trays, immersed in boiling lye for 5 seconds to 10 seconds, or until the skins crack. The strength of the lye should be 1lb. to 10gals. of water. The prunes are lifted from the boiling lye and tipped into a draining board, after which they pass to a board, which has sharp-

pointed needles standing up about one-eighth of an inch. These needles prick the skin, allowing the moisture to escape more readily whilst the fruit is drying. The pricking boards are arranged with sufficient slope to allow fruit to roll to receiving tins or trays. Fruit usually takes about five days to seven days in good weather. Silver prunes are sulphured before being placed in the sun to dry. California yearly exports vast quantities of prunes, as high as 174,000,000 lbs. in a season. In the Santa Clara Valley alone there are upwards of 4,000,000 French prune trees, and over 1,000,000 silver prunes. The valley of the Murray will be a changed locality when we grow prunes on such a scale. I have successfully dried a small quantity of prunes (Fellenberg) for a number of years, and the quality and flavor has been excellent.

#### THE FIG.

"Another fruit that Australia imports is the fig, and it ought not to be. Fig growing was one of the early industries of California, and the white Adriatic was extensively planted, but it was not until the introduction of the Smyrna fig and the Capri wasp that the industry was placed on a safe financial footing. The quantity dried is now running into millions of pounds per annum. The method of drying the Smyrna or Calmyrna, as it is known in the United States, is to allow the fruit to partially dry on the trees, then shake it off. This falling from the trees extends over a period of about six weeks. The fruit is dipped for about half a minute in a boiling solution containing 3 oz. of salt to every gallon of water. The fruit is then spread on trays and placed in the sun. About the second day it is turned. Four days is generally sufficient to dry figs. You must be careful not to overdry, as the skins toughen. They should have a leathery feel when worked between the thumb and finger. They should be collected from trays as soon as dry and placed in sweat boxes, as sweating will soften the skin. Figs when ready for packing are again dipped in 4 oz. salt to the gallon and drained for a few hours, then steamed to kill grubs, &c.; but I have used the packing dip, the second one, hot, which answered the purpose, as the fruit kept well after this treatment. There can be no doubt about the ready market for dried figs, and as the Smyrna fig and Capri wasp have been successfully introduced, this is one of the lines we should supply, and not trust to imports.

#### THE PEAR.

"The pear is also a fruit that we have to deal with to a certain extent in the dried state. In Australia we have not gone in extensively for this fruit, probably Messrs. Basye and Howie, of Remmark, are the largest of our river driers. They believe that it is probable that this fruit may be overdone, as far as drying alone is concerned, and they have carried out some experiments in the hope of establishing an export trade that would place this line on a good footing. The dried pear is certainly very nice, and of good appearance, and should, if kept on the market, create a demand. The fruit can be picked when quite firm, just changing color, placed in sweats, and cut as they ripen. Cut in halves, they are sulphured and dried. Good weather

is essential, as if bad weather ensues, loss is fairly sure to occur. Given preserving works or direct railway connection, a large quantity of pears could be disposed of. In California a pack amounting to 14,000,000lbs. per annum is disposed of.

#### THE ZANTE CURRANT.

"The currants are the simplest of all fruits to deal with, but yet only last season a friend of mine gathered his crop at such a stage that he succeeded in producing a very light, sour currant from what, if allowed to ripen properly, would have turned out a fair sample. Ripeness is the main point. If the fruit is perfectly ripe, and it is dried in the shade, most persons obtain a fair sample. Care must be taken in picking, and the fruit placed on wire racks or trays. If the day is not very hot, a few hours in the sun will not hurt, and will quicken the drying, but currants must be dried in stacks. I think the wire rack the best method of dealing with currants—once it is on the rack, if roofed, you have your fruit under control, and hessian side curtains will enable you to shade your fruit as desired. The class of rack is a matter every man must please himself about, but if I might advise, after seeing a good number, I would advise 6ft. netting. The greater width can be managed all right, and very little extra timber will be required for 6ft. than for 4ft. 6in.

#### SULTANAS.

"In picking sultanas be sure that the fruit is quite ripe, if not you will lose in weight. Last year I advised a dip of about 1lb. of caustic to 18galls. to 20galls. of water. If I should advise now, I would extend the quantity of water from 18galls. to 21galls. I know that there are some who recommend a much stronger dip, but I have never succeeded in getting a good sample at a stronger rate, but I have produced fine samples at 1lb. to 25galls. A great deal depends on the quality of your fruit. If ripe and crisp, with tender skins, not exposed to too much direct sun, a lye of 1 to 25 is strong enough; on the other hand, if slightly wilted, 1 in 15 might not be too strong. You do not need to split the grape, only slight cracks are needed. A great deal depends on the judgment of the man operating at the dip, for sultanas only need plunging in the lye, regulating the time by heat and strength of lye. I have not used a thermometer, but to a new hand I think it might be a help. Experienced men judge by the appearance of grapes as they emerge from the dip. Spread the fruit on the trays lightly, and the same on the racks. About eight days' good weather will generally do sultanas. I have dried them in four days, but that is too quick, and has a tendency to harden the skin. If too slow in drying the color deteriorates. Sultanas can be dried on racks or trays, but will stand more sun than currants. Sultanas require sweating.

#### GORDOS.

"The Gordo, from which we obtain the Lexia of commerce, grows to perfection on the Murray, and splendid samples of raisins have been produced year after year. But when we overtook the Commonwealth

requirements, the price became so low that the Gordo fell into disfavor; but with the advent of the distillery it partially regained its former place. In drying, a stronger lye is needed, about 1lb. to 8galls. of water being most in favor. That *Lexias* of fine quality can be produced on this river there can be no question, but all persons planting these vines must make up their minds to have a portion of their crop passed on to the distillery. Where one is situated in the district, and your fruit can be carted in a fresh state, it simplifies the matter; but in such cases it might pay best to plant Doradillo. The advantage in the Gordos is that they produce a fine *Lexia*, a good distilling grape, and with the White *Museat* of Alexandria form the principal source of our table raisins. I have had some experience in drying table raisins, and where a man can attend to it himself it might pay to dry some. Only the very finest bunches should be used, and remember you cannot cart them in in boxes and spread on trays on your drying ground. The bunches must be carefully cut, handled only by the stem, and defective berries must be cut out, holding the bunch by the stem; then place carefully on a tray. Every bunch must be treated in this manner. No rain or dew must fall on the trays of grapes destined as table raisins after being cut, as that would spoil the bloom, and its retention is one of the principal objects aimed at. When the grapes have been some time in the sun, say three or four days, and are slightly wilted, the trays may be carefully removed to a drying ground, so that they may be better under control. The best Spanish raisins are never turned, but here they are generally turned after eight to ten days. When the bunches are nearly dry they are sorted, and when the berries no longer exude a watery fluid when rolled between thumb and finger, they are placed in boxes of about 25lb. each. Do this with care, and while the berries are quite hot. After a few days the stems will have toughened, and can be handled, and are then ready for packing; but before being packed each bunch is held up by the stalk and any inferior or damaged berries are cut out. The layers are generally put up in neat paper-lined boxes, holding about 5lb. each.

#### YOUR LEISURE MOMENTS.

"During the fruit season any of you who have extremely fine Gordos, and find time hanging heavily on your hands, may fill in all your leisure by drying a ton of layers. The labor question in Australia certainly prohibits anything like an attempt to produce layers on a large scale, but a little might be done where a man's family could attend to the work, for I am satisfied that only a person interested will take the care that is necessary to produce good table raisins. In conclusion, I would say that the man who takes up the growing and drying of fruit as his life's business, must be prepared to work and to give that business his best attention. He must seek ever to produce not only the largest crops, but also the best quality in the dried article that is placed upon the market. And I would like him to remember that, however much he may know regarding the growing and drying of fruit, he will never know all there is to learn in connection with it. With the exception of about seven years of my life, I have spent it all

in trying to get a living out of the soil, and well over 20 years I have devoted to trying to learn something of horticulture, and the little I have learned is just sufficient to show me the immensity of the unexplored regions lying all around. But I am satisfied that if a man will work and think, take advantage of every means at hand to accumulate knowledge, in this business he can make a fair living, and that amidst pleasing and ofttime beautiful surroundings."

#### THE DISCUSSION.

Mr. H. S. Taylor said that Mr. Hopkins, of Mildura, had made a commercial success of the Smyrna fig, and had grown the fruit apparently at not a heavy cost. Mildura had at the time quite a large area under figs, but they were mostly Genoas. The Adriatic fig was also a success, but it was not payable to grow large quantities. He advocated the growing of the Adriatic figs, and if the Smyrna fig proved a success, then they could be grafted on to the Adriatic, which made an excellent stock. Mr. Hopkins had informed him that the Smyrna fig could be dried on the tree and then shaken off.

Mr. Ross—That is if the birds will leave them alone.

Mr. Taylor said that Mr. Hopkins had also informed him that the picking of the Smyrna fig was not attended with the inconveniences which obtained with other varieties.

Mr. Beverley (Pyap) said that he had made a success of the white Adriatic fig. If the packing could be done at home it was preferable, as the fruit required careful handling. He found that the Adriatic fig grew best on deep sandy soil, and when they got away from the deep soil the quality fell away. He thought the Adriatic preferable to the Smyrna figs he had seen on Mr. Hopkins's block.

Mr. F. H. Basye (Renmark) said that his firm had sent 20 boxes of pears to London, and the returns, which had just been received, showed that they brought 95s. per ewt., which was highly satisfactory, as it brought them 8*3*/<sub>4</sub>d. per lb., and he felt that there was no reason why they should not capture the market. He urged that the pears should be sulphured until they were like a pudding. They had washed pears and peaches with a caustic solution, and it improved the fruit. The quantity of caustic used was about 1lb. to 50galls. of water. The drying tray most suited for pears was the ordinary 3 by 2, but they must keep the trays well separated, as the fruit must have air.

Mr. Quinell said that the finest dried pear he had ever seen was the Poire de Berri, *viz.* He had seen the gloss on prunes improved by the use of the prunes themselves—that was by a solution made by boiling prunes and using sugar. But he had also seen an improvement made by the use of molasses instead of sugar, which made the prune darker.

Mr. H. S. Taylor (Renmark) said that Mr. J. M. Smith's solution was 10lbs. prunes, 5lbs. sugar, and 2oz. salt. The whole question of prunes for the river was to get the best variety suited to the district, and if that was settled there was a future for prunes on the river settlements. The French prune was the most successful in California, and might ultimately prove the best for the river; but so far it had not proved a success.

Another speaker said that glycerine had been used for prunes.

Mr. Waters (Renmark) said that he advocated 4ft. drying racks in preference to the 6ft. rack.

Mr. A. E. Ross (Waikerie) did not think there was much to be said for the prune on the river.

Mr. Francis (Waikerie) said that he had the most success with the sugar prune. He thought the question of the stock was a great factor, and he believed that the apricot would prove a suitable stock for the river.

Mr. W. E. Muspratt (Renmark) agreed with Mr. Francis that the stock was the important factor.

Mr. Waters (Renmark) held that it was essential to have thermometers both inside and outside the dip, as in hot weather the fruit would take a hotter dip.

Mr. Beverley said that he had found 5ft. netting most suitable for racks. The 6ft. netting at the bottoms took the whole width of the hessian, and the upper racks gave a margin of 6in.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on May 9th, 1917, there being present Messrs. F. Coleman (chair), A. M. Dawkins, G. Jeffrey, J. Miller, T. H. Williams, W. S. Kelly, Professor Perkins, and H. J. Finnis (Acting Secretary).

Apologies were received from Messrs. Tuckwell, Colebatch, and Laffer.

*Experimental Farm on the Murray.*—The Minister of Agriculture wrote, in reply to the Board's communication, advising that an experimental farm should be established on the Murray. Money had been put on the estimates, but owing to the financial position, no expenditure could be incurred this year. Full consideration would be given to the claims of Berri when the site for the farm was being selected.

The Minister's communication made no reference to the Board's recommendation made on August 30th, 1916, and a deputation, consisting of Messrs. Coleman, Dawkins, and Jeffrey, was appointed to wait on the Minister and discuss the matter.

*Local Supply of Bone Manure.*—The Secretary stated that, from inquiries made, he had ascertained that the Abattoirs offal was being retained in this State for the purpose of the manufacture of manure.

*Roads Legislation.*—The Secretary reported that the Secretary of the Local Government Department had intimated that the spirit of the first two suggestions made to Branches by the Board in connection with minimum loads to be carried for country roads, and the width of tyres, was being embodied in a draft Bill at present being prepared. The Board instructed the Secretary to make available to the Local Government Department any suggestions received from Branches in this connection.

*Destruction of Foxes.*—Arising out of resolutions passed by the Conference of South-Eastern Branches, consideration was given to the question of effectively controlling the fox pest. The Chief Inspector of Stock referred to experiments which had indicated that the bones of foxes and other animals poisoned with strychnine retained the toxic properties of the poison for as long a period as 14 years, and on that account the use of strychnine might result in destruction of live-stock. It was decided to seek a report from the Director of Chemistry on this matter.

*Australian-made Cornsacks.*—The following resolution was received from the Butler Branch of the Agricultural Bureau:—“In the opinion of this Branch, Australian-made bags should be made full standard size.” The Branch pointed out that in some cases the capacity of the locally-made bag was 20lbs. less than that of the imported article. After due consideration, the board decided that, whilst they were fully aware of the desirableness of doing everything to encourage local manufacturers, it was not reasonable that the producers should be subjected to unnecessary difficulties, and the Minister of Agriculture was therefore recommended to introduce legislation making it necessary for locally-made bags to conform to the same standard as that imposed on the imported sacks by the provisions of the Commerce Act.

*1917 Congress.*—It was decided that the usual Annual Congress should take place during show week this year, and a sub-committee, consisting of Messrs. Jeffrey, Colebatch, and Professor Perkins, was appointed to supervise arrangements.

*Branches.*—Permission was granted to the Roberts and Verran, Canowindra, Bell, and Yabmanna Branches to go into recess for 12 months, or the duration of the war. Each Branch had written to the effect that many of its members had gone to the front, and others had left the district. At the instance of Mr. Jeffrey, it was decided to intitiate that the Board felt proud that the members concerned had volunteered for active service.

*Leave of Absence.*—On the motion of Mr. Jeffrey, it was decided that Mr. W. S. Kelly should be granted leave of absence from the Board until the termination of the war, on account of his enlistment for active service.

*Congratulation to Col. Rowell, C.B.*—The Board decided to forward a letter of congratulation to Col. J. Rowell, C.B., on his election to the Senate.

*New Members.*—The following new members were added to the rolls of existing branches:—Rosenthal—Roy Luck; Clare—Jas. Scott, J. B. Nolan, B. E. Gray, J. Nayda, S. J. Bochner; Muandoora—Arthur Hewett, Fred Dolling; Crystal Brook—Roy L. G. Saint; Salt Creek—C. Vanning, W. R. Lee, P. Gale; Mimupia—F. McPhail; Yadnarie—Jas. Denholm; Geranium—Clyde Pronse, Wm. H. Phillips, A. Fisher; Bookpurnong East—J. B. Roberts, A. W. Schier; Tatiara—Thos. Hill; Mount Barker—W. H. Flemming; Lone Pine—O. Kock, R. Neldner, H. A. Brocate; Monarto South—A. Schroder; Port Pirie—Alf. Fenne; Kybybolite—Jas. W. Stephens; Orroroo—W. H. Birrell; Cygnet River—B. Govett.

## DAIRYING ON IRRIGATION AREAS.

Mr. G. Lane, of the Murray Bridge Branch of the Agricultural Bureau, contributed a paper on "Dairying on the Irrigation Areas," at the recent Conference of Murray River Branches. The methods of cultivation adopted on some of the reclaimed areas adjacent to Murray Bridge provided a valuable object lesson, he said.

### TILLAGE ON RECLAIMED LANDS.

"We find by experience that these reclaimed soils require different treatments. The soil lying adjacent to the river is extremely rich, and in an ideal state for growing any kind of fodder or root crops. Its natural fertility is something wonderful. It is very important to break up and cultivate this land thoroughly. Plough it to a depth of from 4in. to 6in., and work it down to a fine tilth. Use disc harrows, then ordinary harrows; afterwards the roller, and then, if it is not fineing down to satisfaction, give it a good watering. Drain off the water within 12 hours, and when you go over it again with the harrows you will get wonderful results as the consequence of this treatment. Not until it is equal to a flower bed is it advisable to seed. If you seed on a poor tilth it means a poor crop, especially if sown down in lucerne. This land will give at least six heavy hay crops per annum, and three short cuts or grazings. The lucerne continues to grow with vigor through the winter months. I doubt whether any other place in Australia can beat these reclaimed lands for the abundance of its lucerne crops, either in its green state or converted into hay. This frontage land, when sown under lucerne, will stand a fair amount of water if it is drained off rapidly, otherwise the lucerne plant will suffer. The back land, or what is termed the 'gut' of the swamp, requires different methods: it is waterlogged, and more in the form of peat. This land can be cultivated and brought down to a fine tilth at half the cost of frontage land, but the water must be kept away by cutting well-defined drains around it. This land is equal to any other portion of the swamps if it is kept thoroughly drained, and if fallowed and then sown down with lucerne, and every care taken to keep the water away from it, excellent results will be secured.

### CROPS TO GROW.

We have found by experience that practically anything will grow to perfection on the swamps. The question of the hour is what is most suitable. For instance, all kinds of vegetables and flowers run riot. All classes of millet become a nuisance; therefore, as a dairyman who has paid for his experience, I advocate lucerne, maize, barley, oats, and wheat. You cannot go wrong with these. Lucerne is the best for all-the-year-round feeding; maize a stand-by as green feed or in the form of ensilage; barley, oats, and wheat as green feed or for grazing, or as catch-and-cover crops for lucerne. It is possible to get two bumper crops in the summer months, say, from October to April.

Then you have five months left out of the year in which to grow winter green feed, such as barley, oats, and wheat. By converting the maize into ensilage you are harvesting the cheapest and best fodder for winter use. The actual cost per ton this year, to me, including ploughing, cultivating, sowing seed, and putting through the ensilage cutter into the silo was 7s. 6d. On the dairy farm the silo is indispensable. It spells success, being the least expensive of all methods of conserving foods for the dairy or any other stock for winter feeding.

#### A WORD ABOUT THE COW.

I have on several occasions explained what a good cow ought to return in 12 months. We have a few good ones in the States, but they are very few, and are lost sight of among the great number of profitless animals. The trouble is that we have not got the animals in the country, and the dairymen are compelled to keep cows of only 300gall. capacity alongside others that are giving up to 1,000galls. and 1,200galls., each cow getting the same amount of feed and attention. This is a serious loss to the State, and must be remedied; therefore I say look to the bull to build up cattle which will compete favorably with those of any other country. It matters not whether milkers or beefers are required, the right class of stock can only be produced by keeping a pure-bred sire. It is the profitless cow that keeps the average of the State so low, and it cannot be expected that such a cow, with even the best of pure sires, can throw profit-making milkers. We are waking up to the fact that there are only a few 800gall. cows in the country. We want 1,200gall., aye, even 1,800gall. cows. The haphazard methods of the past must give way to some form of law that will enable the State to remedy this defect. Considerable attention must be observed in the selection of a tip-top herd of milkers of different types, and pure sires of vigorous habits, the offspring of milkers well above the average line. And now is the opportune time to commence such a dairy. If the Government spent £20,000 on the venture, it would be the finest proposition ever entered into. If such a venture were put into operation, the heifer calves from the dairy should not be sold to any dairyman other than those having tested pure-bred bulls, and the young bulls could be sold at a nominal figure to all and sundry, to help build up the herds of the State. We want tens of thousands of such stock."

In reply to questions, Mr. Lane said that an acre of lucerne on the swamp lands would carry two cows. He advised dairymen to always go in for pedigree animals, and he was a strong believer in the Jersey bull. In regard to Shorthorns, he had found that if they imported the purest breeds of Shorthorns from England, they, in a few years, went to beef.

## THE AGRICULTURAL OUTLOOK.

### REPORT FOR THE MONTH OF MAY.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental farms mentioned below have been prepared by the respective managers:—

*Boorowrie*.—Weather.—The beginning of May was dry, but on May 6th the dry spell broke up, and 18 out of the next 21 days were wet. The fall of over 4in. is a record for the month of May since 1898, when records were first kept. Crops.—Very little grain has been sown, the excessive wetness of the season has hindered sowing. Natural Feed.—Young grass is shooting, but the feed is weak, and the dry grass has been spoiled by the rain. Stock is in fair condition; some farmers have lost sheep. Pests.—Mice are very destructive, in some cases destroying a third or more of the wheat saved for seed. Miscellaneous.—Rabbits are becoming numerous.

*Pyre's Peninsula*.—Weather.—The weather broke up early in the month, and it has continued cool and showery ever since. Up to date of writing (25th) we have received 280 points of rain, which is over 1in. above the average for the previous two months of May. Very little really cold weather has been experienced. For the year up to date we have received 6½in. of rain; considerably more than the average for the first five months. Crops.—Farmers are hard at sowing as much as possible. The showers have deterred the work a fair deal, and this fact, coupled with the poor burning season, will mean a fair amount of comparatively late-sown crops. Natural feed is coming along plentifully, and the district will be greatly in need of more stock in the near future. Pests.—The mice are still doing considerable damage, especially in sheltered places.

*Kyphobolte*.—Weather.—The dry spell continued up to the 6th May, but since then almost daily falls of rain have been recorded, totalling 472 points. These prolonged wet conditions are unusual for this month. Crops.—Very little wheat was sown before the rains commenced, and since then practically no opportunity for sowing has occurred. Some oats had been sown previously, but generally speaking very little sowing has been done, and the season so late that the area sown will be greatly diminished. Natural feed is very abundant. Stock generally are in good order; lambing results have been very satisfactory to date. Pests.—Less trouble than expected has resulted from foxes, probably accounted for by the fact that rabbits are plentiful.

*Turretfield*.—Weather.—May turned out a very wet month, and from the 6th to 27th a total of 408 points were registered. During the period mentioned there were only two days on which no rain fell. This has been the wettest May for seven years, and the rainfall is nearly four times as great as during the same month last year. No frosts were experienced. Crops.—Owing to the mice plague farmers were afraid to sow their crops before rain, and since the rain started on the 6th it was so continuous that operations had to be almost entirely suspended. It was only during the last two or three days of the month that the land was in a workable condition. This fact has considerably shortened the sowing season, and work is now being pushed on with all possible speed. Natural Feed.—Fields are showing green, and the heavy rains will have a beneficial effect on all grasses. The stubble lands did not yield such good grazing this year, on account of the ravages of mice in the paddocks. Stock are all in fair to good condition. Draught stock are showing an improvement, probably owing to the rest they had during the wet weather. Pests.—After the heavy rains there has been a decided falling off in the number of mice in the district, though they are still very plentiful. A few large eagles have been observed. There are some foxes in the district, but no serious interference with the lambs has so far been reported.

*Fritch*.—Weather.—Rainfall for month, 115 points; average for month at Veitch, 125 points. Very fine sowing rains have fallen, enough to give the early-sown a good start. Crops.—Wheat fields sown early in the month are showing a nice, healthy green color, and should now come along well. Natural Feed.—Good. Stock.—All in healthy condition. Pests.—Mice are doing a lot of damage in the fields, eat ing the young shoots as the grain germinates. Miscellaneous.—Farmers in the district have stopped sowing, awaiting a good fall of rain to kill mice.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on June 1st:—

**BUTTER.**—The weather during the month of May was wet, but butter production only showed a slight shrinkage, so that there is still a small surplus in this State of second and third qualities, which, in the absence of freight for Europe, will doubtless be absorbed in interstate markets. A proportion of first quality is still coming from the eastern States—in fact we have now to look as far away as Queensland to help to make up the shortage in supplies. Values at the end of the month for butter in pound prints were:—“Alfa,” 1s. 7½d. per lb.; “Primus,” 1s. 7d.; third grade creamery, 1s. 3d. to 1s. 4d.; choice separators and dairies, 1s. 4d. to 1s. 5½d.; fair quality, 1s. 3d. to 1s. 4d.; store and collectors’, 1s. 1½d. to 1s. 3d. per lb.

**Eggs.**—Supplies are somewhat shorter than was the case during April, so that the market advanced further, the rates loose in the mart at the close of this month being—Hen, 1s. 7d.; duck, 1s. 8d. per dozen.

**CHEESE.**—During the early part of May demand was slow, but later on stimulated inquiry was recorded, with considerable interstate trade. The proclaimed price was raised ½d. on the last day of the month. Present values are from 9d. to 9½d. per lb. for large to loaf.

**HONEY.**—Has been scarce, with values showing an improvement. Prime clear extracted 4½d. to 4¾d.; second grades 3d. to 3½d.; beeswax very saleable at 1s. 8d. to 1s. 9d. per lb.

**ALMONDS.**—Also have advanced in price, with export orders not being filled. Brandis, 11½d.; mixed softshells, 11d.; hardshells, 6d.; kernels, 1s. 9d. per lb.

**BACON.**—Local curers have been able to obtain larger numbers of the live animals, so that supplies arriving have shown a marked increase. However, only slight fluctuations were recorded in rates, best factory cured sides selling 10½d. to 11d.; middles and hams, 1s. to 1s. 1d.; rolls, 10½d. per lb.

**LIVE POULTRY.**—The quantity of birds coming forward continues to be on the heavy side, but demand throughout the month having been brisk, good prices ruled. Heavy-weight table roosters, 2s. to 4s. each; nice-conditioned cockerels and plump hens, 2s. to 3s.; light birds, 1s. 7d. to 1s. 10d.; ducks, 2s. 3d. to 4s.; geese, 4s. 9d. to 5s. 8d.; pigeons, 6d. to 6½d.; turkeys, from 7d. to 9½d. per lb. live weight for fair to good table birds.

**POTATOES.**—Large quantities have been handled from the Adelaide Hills and South Eastern districts, imports from other States having been confined to seed lines only. **ONIONS.**—There has been an improved inquiry for onions, but local and South-Eastern growers appear to have no difficulty in filling all orders, although in a few instances buyers have purchased from Victoria. Prices—Potatoes, £1 to £5 per ton on trucks Mile End or Port Adelaide. Onions, £5 to £5 15s. per ton on trucks Mile End or Port Adelaide.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of May, 1917, also the average precipitation to the end of May, and the average annual rainfall.

Station.	For May, 1917.	To end May, 1917.	Avg. to end May.	Avg. Annual Rainfall.	Station.	For May, 1917.	To end May, 1917.	Avg. to end May.	Avg. Annual Rainfall.
FAR NORTH AND UPPER NORTH.									
Oodnadatta	—	3-28	2-39	4-76	Spalding	5-10	8-16	5-22	20-25
Tarcoola	0-04	4-36	2-20	7-58	Gulgahre	3-95	8-48	5-70	19-74
Hergott	—	2-47	2-48	6-04	Bundaleer W. Wks.	4-31	7-90	4-52	17-29
Parina	—	2-95	2-80	6-70	Yacka	3-93	7-84	4-57	15-27
Leigh's Creek	0-10	4-96	3-58	8-66	Koolunga	3-72	8-38	4-81	15-94
Beltana	0-10	5-08	3-71	9-22	Snowtown	3-60	7-03	4-95	15-70
Blinman	0-63	4-57	4-98	12-82	Brinkworth	3-23	7-37	4-39	15-48
Hockina	0-97	9-00	3-03	—	Blyth	4-31	8-39	5-31	16-34
Hawker	1-40	9-05	3-73	12-22	Clare	7-07	13-23	7-54	24-30
Wilson	1-24	6-50	3-70	11-73	Mintaro Central	7-59	13-65	6-16	21-99
Gordon	0-89	8-46	2-88	10-26	Watervale	8-27	15-77	8-26	27-17
Quorn	1-89	6-66	4-13	13-78	Auburn	8-10	14-40	6-95	24-25
Port Augusta	0-51	3-75	3-63	9-46	Hoyleton	4-07	8-65	5-78	17-96
Port Augusta W.	0-66	4-16	3-17	9-36	Balaklava	3-01	6-92	5-41	16-03
Bruce	0-65	5-45	2-83	10-01	Port Wakefield	2-63	7-62	5-02	13-13
Hammond	0-83	8-24	3-07	11-46	Tennoie	2-42	7-06	4-28	13-71
Wilmington	1-81	6-66	5-68	18-26	Yarrowie	2-43	8-14	4-34	13-91
Willowie	1-29	7-38	3-34	11-90	Hallatt	3-21	6-25	4-71	16-40
Melrose	5-07	11-93	7-37	23-04	Mount Bryon	3-64	6-78	4-39	15-73
Booleroo Centre	2-49	8-46	4-72	15-83	Burra	4-63	7-48	5-50	17-82
Port Cormier	1-49	5-61	4-57	12-84	Farrell's Flat	3-86	6-59	5-73	18-87
Wirrabara	4-34	9-89	5-77	18-91	WEST OF MURRAY RANGE.				
Apnila	2-20	7-05	4-85	15-08	Mangora	5-09	9-78	5-41	18-09
Cradock	1-11	7-25	3-37	10-86	Saddleworth	5-26	9-66	6-42	19-69
Carrieton	1-35	8-70	3-73	12-22	Marabel	5-17	9-01	5-88	18-94
Johnburg	1-03	6-72	3-07	10-21	Riverton	5-89	11-95	6-57	20-48
Eureka	1-98	8-93	4-04	13-24	Tarlee	5-07	9-20	5-26	17-48
Orrooro	2-51	9-00	4-45	13-42	Stockport	4-03	7-48	5-10	15-89
Black Rock	2-14	8-39	4-07	12-25	Hamley Bridge	3-59	7-18	5-31	16-45
Petersburg	2-06	9-13	4-28	13-07	Kapunda	5-46	9-13	6-47	19-67
Yongala	2-56	9-36	4-20	13-94	Feeching	3-70	7-25	5-64	17-85
NORTH EAST.									
Uculta	1-68	7-82	—	—	Greenock	5-18	9-15	6-51	21-46
Nackara	0-87	7-82	2-34	—	Truro	4-98	8-82	5-94	19-74
Yunta	0-48	7-06	3-06	8-22	Stockwell	4-59	8-41	5-96	20-30
Waukaringa	0-25	5-09	2-84	7-94	Nuriootpa	4-91	8-41	6-22	21-25
Mannahill	0-79	5-37	3-09	8-46	Angaston	5-38	9-97	6-33	22-25
Cockburn	0-36	6-48	3-09	7-97	Tanunda	5-46	9-25	6-91	22-28
Broken Hill, NSW	0-47	7-81	3-60	9-63	Lyndoch	4-99	9-31	6-51	23-01
ADELAIDE PLAINS.									
LOWER NORTH.									
Port Pirie	1-67	6-65	4-70	13-21	Mallala	3-14	7-05	5-48	16-88
Port Broughton	2-25	5-30	4-75	14-33	Roseworthy	3-94	8-04	5-51	17-51
Bute	3-47	7-13	4-83	15-42	Gawler	4-57	9-61	6-38	19-21
Laura	3-41	8-45	5-50	18-22	Two Wells	2-17	5-65	5-39	16-36
Caltowie	3-12	8-03	5-21	17-27	Virginia	3-19	8-36	5-78	17-58
Jamestown	4-08	8-52	5-11	17-48	Smithfield	4-73	9-82	5-41	17-30
Gladstone	3-14	7-96	4-89	16-00	Salisbury	3-98	9-17	6-21	18-57
Crystal Brook	2-60	7-02	4-92	15-62	North Adelaide	6-07	13-38	7-72	21-49
Georgetown	3-12	8-68	5-76	18-32	Adelaide	5-19	11-21	6-93	21-04
Narridy	3-14	7-77	5-26	16-79	Brighton	4-62	11-75	6-19	—
Redhill	3-55	7-98	5-21	16-79	Glenelg	4-08	9-88	5-90	—
					Magill	7-14	14-28	8-10	19-93

## RAINFALL—continued.

Station.	For May, 1917.	To end May, 1917.	Avg. to end May.	Avg. Annual Rainfall	Station.	For May, 1917.	To end May, 1917.	Avg. to end May.	Avg. Annual Rainfall
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## ADELAIDE PLAINS—continued.

Glen Osmond ...	7.57	14.46	8.58	28.19
Mitcham ...	5.96	12.96	7.16	23.47
Belair ...	—	—	8.88	28.64

## MOUNT LOFTY RANGES.

Teatree Gully ...	7.57	14.46	8.58	28.19
Stirling West ...	14.45	25.78	13.22	46.79
Ursula ...	16.01	27.02	12.67	44.35
Clarendon ...	7.69	15.47	10.30	33.67
Morphett Vale ...	4.05	10.50	7.31	23.32
Noarlunga ...	4.11	10.95	6.30	20.28
Willunga ...	5.29	13.45	8.14	25.98
Aldinga ...	3.41	10.68	6.17	20.34
Normanville ...	3.83	9.57	6.55	20.65
Yankalilla ...	5.00	11.41	7.30	22.78
Cape Jervis ...	2.90	7.40	4.96	16.34
Mount Pleasant ...	6.29	10.97	7.75	26.87
Blumberg ...	7.83	18.82	11.77	29.58
Gumeracha ...	9.70	17.41	8.93	33.30
Lebethal ...	1.52	8.95	9.50	35.38
Woodsdale ...	8.22	15.18	8.59	31.87
Hahndorf ...	6.77	13.18	9.54	35.45
Nairne ...	6.06	12.48	8.53	28.83
Mount Barker ...	7.81	16.21	9.21	30.93
Echunga ...	7.88	16.14	9.89	32.83
Macclesfield ...	6.89	14.33	8.81	30.72
Meadow ...	10.99	19.64	10.47	35.52
Strathalbyn ...	3.49	8.12	6.24	19.28

## MURRAY FLATS AND VALLEY.

Wellington ...	2.94	6.92	5.10	15.01
Milang ...	2.42	5.77	5.28	16.08
Langhorne's Brdg ...	2.47	6.33	4.77	15.27
Taiham Bend ...	3.15	8.52	1.65	—
Murray Bridge ...	1.82	5.23	4.86	14.32
Collington ...	2.10	6.34	5.11	15.65
Mannum ...	1.69	4.38	4.24	11.47
Palmer ...	2.97	5.49	4.57	15.60
Sedan ...	1.17	1.71	3.96	11.92
Blanchetown ...	0.46	1.52	3.91	—
Eudunda ...	3.70	6.39	5.30	10.71
Sutherlands ...	1.31	2.80	3.01	17.33
Morgan ...	0.76	2.23	3.15	10.60
Overland Corner ...	0.63	4.01	4.05	11.42
Rennmark ...	1.10	5.91	3.53	10.93
Loxton ...	1.42	7.71	2.89	—

## WEST OF SPENCER'S GULF.

Eucla ...	1.99	5.66	4.46	10.13
White Well ...	1.83	5.19	3.04	9.67
Fowler's Bay ...	4.31	6.98	4.04	12.11
Penong ...	3.13	6.01	4.22	11.93
Murat Bay ...	2.60	5.66	3.15	—
Smoky Bay ...	3.02	5.33	—	—
Streaky Bay ...	3.13	6.21	4.56	15.31

## WEST OF SPENCER'S GULF—continued.

Port Elliot ...	4.76	8.35	4.46	16.49
Port Lincoln ...	4.30	7.73	5.92	19.88
Tumby Bay ...	1.88	5.68	4.26	15.00
Carrow ...	2.74	8.88	—	—
Cowell ...	0.73	4.80	4.41	11.76
Point Lowly ...	1.05	5.24	4.00	12.21

## YORKE'S PENINSULA.

Wallaroo ...	3.08	6.38	5.03	14.05
Kadina ...	3.36	6.60	5.41	15.88
Moonta ...	3.30	7.83	5.38	15.22
Green's Plains ...	3.02	6.57	4.87	15.73
Maitland ...	4.92	10.75	6.39	20.08
Ardrossan ...	2.70	6.51	4.55	13.89
Port Victoria ...	3.08	8.60	5.09	15.21
Curnamulla ...	2.98	9.43	5.63	18.50
Mirlatton ...	3.53	9.13	5.31	17.41
Stansbury ...	1.83	10.34	5.28	17.06
Warooka ...	3.33	9.61	5.30	17.71
Yorketown ...	2.98	7.83	5.26	17.47
Edithburgh ...	3.50	8.44	5.41	16.48

## SOUTH AND SOUTH-EAST.

Cape Borda ...	4.02	7.69	7.34	25.0
Kingscote ...	2.70	8.36	5.72	18.05
Penneshaw ...	2.35	6.75	6.71	21.54
Cape Willoughby ...	3.43	7.62	6.01	19.69
Victor Harbor ...	4.03	10.25	6.85	22.18
Pon. Elliot ...	3.63	9.30	6.51	20.33
Goolwa ...	4.06	9.46	5.96	17.93
Pinnaroo ...	3.20	5.07	4.90	16.74
Parilla ...	3.06	5.65	—	—
Lameroo ...	3.52	6.19	4.91	16.53
Parrakie ...	3.42	6.66	4.21	—
Geranium ...	3.97	7.73	3.83	—
Peak ...	3.59	8.18	5.00	—
Cooke's Plains ...	3.09	9.41	4.51	11.74
Meningie ...	3.95	9.38	5.99	—
Coonalpyn ...	4.03	9.38	5.30	17.49
Coomandook ...	4.50	9.86	5.09	18.80
Tintinara ...	4.18	8.59	5.59	18.78
Keith ...	3.81	8.66	5.51	—
Bordertown ...	4.64	9.71	5.81	19.76
Wolseley ...	3.78	7.61	5.33	17.52
Frances ...	4.12	8.16	5.78	20.71
Naracoorte ...	4.56	9.28	6.67	23.60
Penola ...	5.22	10.24	8.03	26.78
Lueindale ...	5.49	8.98	6.56	23.32
Kingston ...	6.41	10.73	7.31	24.73
Robe ...	4.67	8.49	7.37	24.69
Beachport ...	5.20	10.24	8.21	27.51
Millicent ...	5.97	10.57	9.07	29.25
Mount Gambier ...	4.83	11.30	9.97	32.00
G. Nthumberland ...	5.33	10.07	8.12	29.03

## \*AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meeting.		Branch.	Report on Page	Dates of Meeting.	
		June.	July.			June.	July.
Amyton	903	—	—	Forest Range	927	—	—
Angaston	*	—	—	Foxton	*	—	—
Appila-Yarrowie	*	—	—	Frances	*	—	5
Arden Vale & Wyacoa	*	—	—	Freeling	*	—	4
Arthurton	*	—	—	Gawler River	*	—	2
Balaclava	*	—	—	Georgetown	*	—	—
Beaufort	*	—	—	Geranium	*	30	28
Beetaloo Valley	904-5	—	—	Gladstone	*	—	—
Befalie North	*	—	—	Glencoe	928	—	—
Berri	922	6	4	Glenope	*	—	—
Blackcath	*	2	—	Goodo	*	—	—
Blackwood	*	18	16	Green Patch	*	—	—
Blyth	*	9	14	Gumeracha	*	—	—
Bookpurnong East	915	—	—	Halidon	916	—	—
Boulder Centre	*	—	—	Hartley	922-7	6	4
Borrika	913	—	—	Hawker	*	—	3
Bowhill	*	—	—	Hilltown	*	—	—
Brentwood	*	—	—	Hockinat	*	—	3
Brinkley	*	—	—	Inman Valley	*	7	—
Bundaleer Springs	906	—	—	Ironbank	*	—	—
Burn	*	—	—	Julia	*	—	—
Bute	*	—	—	Kadina	*	—	—
Butler	*	—	—	Kalangadoo	*	9	14
Caltowie	*	—	—	Kannmantoo	*	2	—
Cancowie Belt	*	—	—	Keith	*	—	—
Currigton	*	—	—	Ki Ki	*	—	—
Carrow	*	—	—	Kingscote	*	—	—
Cherry Gardens	927	5	3	Kingston-on-Murray	*	—	—
Clanfield	*	—	—	Kongorong	929	—	3
Clare	906	—	—	Koonibba	915	—	3
Clarendon	922	4	2, 30	Koppio	913	5	3
Chaypan Bore	*	—	—	Kybybolite	930-8	28	—
Colton	*	—	—	Lameroo	922	—	—
Coomandook	*	4	—	Laura	*	—	—
Coomooro	*	—	—	Leighton	*	—	—
Coonalpyn	916	—	—	Lone Pine	907	5	10
Coonawarra	*	—	—	Longwood	*	—	—
Coorabie	*	—	—	Loxton	*	—	—
Cradock	*	—	—	Lucindale	*	—	—
Crystal Brook	*	—	—	Lyndoch	908	—	5
Cummins	912	2	7	MacGillivray	*	—	—
Cygnet River	†	—	5	Maitland	*	—	9
Davenport	*	—	—	Mallala	†	—	—
Dawson	*	—	—	Mangalo	*	—	—
Denial Bay	*	—	—	Mantung	917	—	—
Dowlingville	912	—	—	Meadows South	*	5	3
Edithie	*	—	—	Menningie	*	—	—
Elbow Hill	†	—	—	Milang	923	—	—
Eureba	†	29	27	Millicent	*	—	10

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Mindarie	*	4	2	Port Pirie	906	2, 30	28
Minlaton	*	29	—	Quorn	*	—	—
Minnipa	914	—	—	Rameo	919	4	2, 30
Mintaro	*	2	—	Redbill	*	—	—
Mitchell	*	—	—	Renmark	919	—	—
Monarto South	917	—	—	Riverton	*	—	—
Moonta	*	—	—	Roberts and Verran	*	—	—
Moorlands	*	—	—	Rosenthal	911	6	4
Morchart	*	2	—	Rosy Pine	921-2	—	—
Morgan	*	—	—	Saddleworth	910	—	—
Murphett Vale	†	—	—	Salisbury	911	—	—
Mount Barker	923-4	—	4	Salt Creek	914	—	—
Mount Bryan	*	—	—	Sandalwood	*	—	—
Mount Bryan East	*	—	—	Sherlock	*	—	—
Mount Compass	†	—	—	Spalding	*	—	—
Mount Gambier	933-8	—	—	Stockport	*	—	—
Mount Hops	*	—	—	Strathalbyn	928	5	3
Mount Pleasant	*	—	—	Sutherlands	*	—	—
Mount Remarkable	*	—	—	Tantanoola	936	—	7
Mundala	†	—	—	Tarcowie	*	—	—
Mundorda	906	—	—	Tatina	*	2	7
Murray Bridge	922	4	—	Tintinara	*	—	—
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Myponga	*	—	—	Uraidla and Summert' n	*	4	2
Myria	*	—	—	Waikerie	*	1, 29	27
McNamara Bore	*	—	—	Warowie	914	—	—
Nantawarra	909	—	—	Watervale	912	—	—
Naracoorte	936	—	—	Wepowie	903	2, 30	28
Narryd	*	—	—	Whyte-Yarcowie	*	—	—
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Netherton	*	—	—	Willowie	*	—	—
North Boorowrie	*	—	—	Wilmington	904	—	—
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Northfield	909-11	5	3	Wirrega	†	—	—
Orroroo	*	—	—	Wollowa	†	—	—
Parilla	*	—	5	Woodleigh	†	—	—
Parilla Well	*	—	—	Woodside	*	—	—
Parrakie	*	—	—	Wynarka	921	—	—
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Penola	*	—	—	Yacka	*	—	—
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Pine Forest	*	—	—	Yanmee	*	—	—
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\* No report received during the month of May.

† Held over until next month.

+ Formal report only received.

‡ In recess until termination of War.

## ADVISORY BOARD OF AGRICULTURE.

Date of Meeting—July 11th, 1917.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### MEMORANDA FOR THE MONTH.

**CONGRESS.**—The Twenty-eighth Annual Congress of the Agricultural Bureau will take place in Adelaide in September next. Branches have been invited to suggest subjects for consideration. These suggestions should be forwarded to the Secretary Advisory Board as early as possible.

**BRANCHES ANNUAL MEETINGS.**—The majority of Branches will be holding their annual meetings during the current month. Regard should be paid to the rule governing membership, i.e., one-third of the members, viz., those that have attended the fewest meetings during the year, retire. Such members are eligible for re-election, on the recommendation of the Branch.

**THE COMING YEAR'S WORK.**—One of the most important matters to receive attention is the mapping out of the work of the Branch for the year. This cannot be too strongly emphasized.

**PINNAROO LINE BRANCHES.**—The Branches situated on the Pinnaroo line of railway will meet in conference at Pinnaroo in the near future. Every member of every Branch in the district should make it his business to be present at the conference.

## REPORTS OF BUREAU MEETINGS.

### UPPER-NORTH DISTRICT. IPETERSBURG AND NORTHWARD I

**AMYTTON** (Average annual rainfall, 11.82in.).

May 8th.—Present: 10 members and three visitors.

**PICKLING SEED WHEAT.**—This subject was dealt with in a paper by Mr. S. Thomas, who referred to the very heavy loss which resulted from smut. While the production of a clean crop of wheat before the introduction of the drill was an easier proposition than it was to-day, if ordinary care were taken it was still possible to produce a crop not affected with smut. He preferred pickling by immersing the wheat in a solution of slightly over 1 per cent. bluestone. The wheat was allowed to remain in the solution to ensure any smut balls contained therein being thoroughly soaked. An interesting discussion followed the reading of this paper.

**WEPOWIE** (Average annual rainfall, 13in. to 14in.).

May 8th.—Present: 11 members and two visitors.

**THE YOUTH ON THE FARM.**—The following paper, dealing with the treatment of the young men on the farm, was contributed by the Hon. Secretary (Mr. Thos. F. Orrock):—In dealing with this subject I wish to point out, first, my opinion why boys in a good many instances prefer leaving the land and working for wages in the cities; and second, some suggestions as to how this crowding to the cities could be prevented. Few things are more astonishing than the want of sympathy between parents and children. Many parents seem insensible to their thoughts and desires. There are two principal causes. One is their difference in age. The fathers are losing, or have lost, interest in many of those things which are just beginning to most keenly interest their children. The children are quick to note this, and the confidence they will give to a comparative stranger they withhold from parents, be-

cause they dread ridicule, coolness, and displeasure. The other fact—parents will insist in regarding their boys as children, even after they are grown up. They cannot understand independence of thought. They must always do exactly as they are told without question; and I contend that the average farmer is 20 years behind the times in the treatment of his boys, as regards stimulating the desire to remain on the land, in comparison to the inducement the fairly well-educated youth meets with in even the comparative small country towns of to-day. Therefore the boy naturally has a desire to enter a branch of work that offers the greatest inducement to his advancement, and where, if he does his work well, he is sure of promotion. My argument is that if the same inducement were offered on the farm hundreds of lads would remain on the land that now go to the over-populated cities of Australasia. In regard to the suggestions *re* making the land more attractive for the farm youth, the most responsible person is the farmer himself. What inducement is it for a lad to leave his city companions and come home from school to the land unless he thinks he can do as well for himself as his city friends? My opinion is that the boys should be taken more into the management of the farm, and have either a certain portion of crop allotted to them, or, better still, a percentage. It would induce them to grow as good a crop as they possibly could, and thus benefit all concerned, and also give the lads an insight into the financial part of the business. In dozens of little ways the farmer could make farming more attractive for his boys by encouraging them when they have done some particular piece of work exceptionally well, and by encouraging competition in local shows, &c. In a country like Australia, where agriculture plays the leading role in promoting national prosperity, it is highly desirable that every inducement possible should be given to youths to stay on the land. And wherever possible the farmer should use the most thorough methods of farming and the most efficient mechanical appliances he can afford.

#### WILMINGTON (Average annual rainfall, 18.26in.).

May 9th.—Present: 11 members and one visitor.

**CLEAN WHEAT.**—Mr. H. Farrell, in presenting a paper with the title “Clean Wheat,” said it was necessary to have the cleanest sample of wheat possible, both for market and for seed. A 1 per cent. to  $1\frac{1}{2}$  per cent. solution of bluestone was the best means of preventing the development of smut. That could be used either with a patent pickling machine, one of which he was using, or by the old method of floor pickling. If formalin were used the seed should be sown immediately after treatment; otherwise it should be kept until after the first week before being sown. Reference was made to the quantity of foreign matter that was bagged with the wheat, and farmers were urged to exercise every effort to produce a clean sample. Messrs. Aughey, Goodenough, W. and G. Schuppan, Molystach, and Zimmermann were agreed that wheat should not be sown unpickled. It was deplorable that such large quantities of rubbish should be shipped with the wheat.

#### MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT)

#### BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

April 13th.—Present: eight members and one visitor.

**FRUIT GROWING.**—A paper dealing with this subject was contributed by Mr. J. Burton. He said—“Fruit trees are more cosmopolitan in the matter of soils than is generally supposed, and each kind will adapt itself to a wide range of soils. Some soils are, however, better suited for particular kinds of trees, and these peculiarities should be recognised by the planter as far as possible. Ground for trees should be carefully prepared, so that the trees may be placed under the best possible conditions for making strong, healthy growth. A good root bed is required to provide the materials for feeding the trees, and secondly to enable the trees to get a firm hold of the soil. Deep stirring of the soil and loosening the subsoil is the most perfect way of preparation, and gives the widest field from which the roots can obtain nourishment and moisture. Heavy soils, more especially, require deep culti-

vation; lighter soils, and more particularly those resting upon open, gravelly, or limestone subsoils, may from motives of economy, be treated in a more superficial manner; but even this class of land will, as a rule, give better results if deeply worked. It is a matter of some importance to growers, in planting fruit trees, that they should select kinds and varieties that are likely to give the most satisfactory results. The first consideration should be to plant such kinds of fruit as are best adapted for the particular locality. Some kinds will adapt themselves to a wide range of climate and soil. Many of these, however, may be cultivated under various conditions, but will thrive better and give more satisfactory returns in some places than others. This object should more particularly be kept in view by cultivators for market. In the warmer districts the fruits that should receive special attention are the grape, peach, apricot, orange, and lemon. All these fruits reach the highest degree of perfection, as the strong heat and light at the ripening period develops their flavor to the fullest. Though the apple, pear, and plum naturally belong to cooler regions, and may be grown with a fair amount of success in the moderately warm districts, yet better results will be obtained from other localities. These fruits, when grown in the cooler districts, will generally be higher in quality and keep better than if raised in the warmer districts. Then again the trees are not likely to prove so durable in warm as in cool districts. In some districts, however, there is a sort of intermediate climate between the warmer and cooler districts, and in those localities planters may indulge in a wider range of fruits with success. Special care should be taken in planting to select varieties of each kind that are best adapted for the particular requirements of the grower, who should decide as to the way in which his fruit will be utilized before starting. If his object is to supply fresh fruit to the market he must, as a rule, have varieties that will yield in succession, and those that will keep well, so that he can meet the demand for a long period. It is also advisable in the case of all dessert fruits that they should be attractive as well as possessing other desirable qualities. Good-looking apples, pears, peaches, and other fruits will always command a more ready market than varieties that are less attractive in appearance. There is some difference of opinion among fruit growers as to the most favorable time for planting, but I favor early planting of deciduous trees. For oranges, lemons, and other evergreen trees, the most suitable time is early autumn or spring. To enable the ground to be worked in the most convenient manner, trees should be planted in squares, and each kind of fruit, or even varieties by themselves, to facilitate treatment. This is more essential with spraying and irrigation; one may require spraying or watering, when another does not. Pruning is one of the most important operations in horticulture. The theory of pruning is to promote development in certain directions by checking it in others. There are two ways in which this may be done, one being the cutting of the branches, and the other the reduction of the roots; one method produces precisely the opposite effect to the other. The art of pruning is to apply to the trees such treatment as will best accomplish some particular purpose, and the operator must take into consideration the peculiar circumstances of each tree before touching it. In pruning to assist a tree to attain a desired form it will be necessary to take into consideration its natural habit, the modification required, and how it is to be effected. The object of the pruner should be to get well-balanced trees, and as perfect in form as possible. Trees should be trained to assume the desired forms from the time they are planted, removing and shortening back such shoots as may be necessary. A well-formed tree is much easier for gathering fruit and more convenient for spraying. Fruits of all kinds should be gathered at such a stage of maturity as will develop their desirable qualities to the fullest extent or best serve the special purpose of the grower. The proper degree of maturity at which fruit should be gathered will, as a matter of course, vary considerably according to the kind. Apples should be gathered immediately before they become fully ripe. If left too long upon the trees the fruit, when kept, is apt to become mealy, and to lose in flavor, more or less. Pears are somewhat peculiar in ripening, and fruit in perfection is seldom obtained if allowed to mature upon the trees. The time the fruit will take to come to perfection, after it is gathered, will vary considerably, according to the variety. It is a matter of importance to growers that they should be able to keep some kinds of fruit for as long a period as possible, in order to extend the season and the demand for their produce. In a discussion which followed Mr. Jacobi mentioned the Japanese plum as a profitable fruit to grow.

## PORT PIRIE (Average annual rainfall, 13.21in.).

April 7th.—Present: nine members.

WHEAT GROWING.—It was often difficult, observed Mr. A. W. Noll, in an address on wheat growing, to determine when to commence seeding operations on land liable to drift. He recommended sowing such land as soon as possible after rain with a wheat which stooled well. Though the returns from land so sown might not be so remunerative, it would probably save the crop from being blown away. It was inadvisable to sow immediately after rain, when the ground was in such a condition that the seed furrows remained open, because the seed would not germinate properly, and, if necessary, the harrows should follow the drill. Land should be tilled lightly to kill the weeds, the more closely to the surface they were cut the more quickly and more likely they were to be killed. When the soil was becoming dry on top it should be cultivated lightly, closely behind the drill; the drilling, if anything, being deeper than the cultivation, because by that means the seed was being placed in damp soil and would have a better chance of germinating. In the discussion which ensued members endorsed the views expressed in the address.

## WIRRABARA (Average annual rainfall 18.91in.).

April 2nd.—Present: 15 members.

SUMMER FALLOWING.—A paper on this subject was contributed by Mr. F. Carson, who referred to the many advantages which followed the practice of summer fallowing, the more particular being the heavier yield, and the absence of diseases on crops on summer-fallowed land. He expressed the view that the land should be ploughed to a depth of 6in., and as it would be pulverised by the rain, there was no necessity to work it down fine. Land treated in that manner should be cultivated before winter fallowing was commenced.

BEETALOO VALLEY, May 14th.—QUESTION Box.—A number of questions were considered by members. Generally they agreed that milk and pollard and also crushed barley constituted the best food for fattening young pigs. Most members favored the Berkshire, and Berkshire and Poland China cross as the most suitable breed for this district. Others favored the Essex. As to the best quantity of seed to sow in this district, opinions varied from 1bush. to 1bush.; and from 50lbs. to 120lbs. super. per acre was considered a suitable dressing.

BUNDALEER SPRINGS, May 1st.—After the compilation of a programme for the year 1917 a general discussion on topics of interest took place. Reference was made to the inferior quality of cornsacks and the variation in size of same. Mr. Travers explained several difficulties that had occurred in working binders.

MUNDOORA, May 7th.—The discussion on pickling wheat, which was commenced at the previous meeting, was continued. Mr. Noble mentioned that he had found sheep dip a cheap and effective method for poisoning mice.

## LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

## CLARE (Average annual rainfall, 24.30in.).

Present: 14 members.

SOME NOTES ON HORSE BREEDING.—Mr. C. Neate submitted the following paper on horse-breeding:—“In introducing the above subject several facts have come under my notice during the last four or five years. I have noticed that there is a falling off in the number of foals reared annually, and also a diminishing number of stallions plying for hire compared with the preceding five years, and one naturally inquires the reason for the falling off. Of course, in horse-breeding, as in all other stock lines, the market rate is a large factor in the natural supply of stock, and it cannot be denied that the market value of horses during the last four or five years has been somewhat low compared with prices ruling some six or seven years ago. The reason of the extreme prices of that period will be found in the fact that the breeding of horse stock had not kept pace with the expansion of cultivation, and with the opening up of large tracts of mallee lands the demand overtook the supply, with the result that high prices prevailed, and those who were

in the fortunate position of being sellers reaped the benefit. To my idea the same conditions are recurring now. If we take into consideration the heavy losses of the 1914 drought, and the large number exported out of Australia for war purposes, and the appalling loss of horses in this awful conflict, one is forced to the conclusion that with the return of peace conditions and the expansion of agricultural areas there is bound to be a good demand for horses, if not at extreme rates, at least at very payable prices, notwithstanding the fact that motor traction will command more attention in the future than it has in the past. That causes one to ask the question, 'What is the best type of horse to breed?' That is for each individual breeder to decide for himself, but whatever type he fixes on he should endeavor to breed the best, for a good horse costs no more to keep than a bad one, and very often less. If I were asked the question which type I personally preferred, my vote would be given to the Clydesdale. Well-bred Clydesdales will always command attention and remunerative prices. They are more quick and jauty in action than the Shire, and having great powers of endurance renders them most suitable for farm or garden; but for heavy haulage on the roads the Shire may be preferable. In selecting a Clydesdale sire I would look for the following points—Strong, masculine head, yet with an entire absence of coarseness; strong neck, deep quarters, well ribbed up, short back, broad over the loins, full hard muscle on breech, but not extending too far down the leg, close knee joints, flat bone, and well developed feet, and standing about 16 hands high. In selecting mares to mate with a sire, judgment must be used to see that if the sire is lacking in any of the foregoing points that the mare is not also at fault, otherwise the fault may be perpetuated in the progeny; if the sire is a hot on the leg, mate him with a close, thick-set mare, or *vice versa*, as the case may be, but above all, breed only from sound stock with a long line of noted ancestors behind them. Even though the cost of service may be a few shillings more, the value of the progeny may be pounds compared with the progeny of inferior and cheaper sires. In this district, especially among the gardeners, taken on a whole, medium draughts are kept, yet from mares of this type a very serviceable type of horse can be raised. If it be desired to breed something more weighty, then cross with the Shire or Clydesdale, or if you wish to breed harness or remounts, cross to the thoroughbred, but let the sire be a stud book horse, and one of proved stamina, and the possessor of a set of sound legs, for no matter how good the body may be, unless the legs are sound the colt is of little value. In my past experience I have, by using a thorough-bred stallion on active medium draught mares, been successful in breeding some first-class harness and remount types, but I would not recommend crossing the latter class again to the blood horse in any but exceptional cases. In conclusion, if these few notes will cause a deeper interest in horse-breeding generally, its object will have been achieved." The President concurred in the view that Clydesdales were the most suitable for farm work. Mr. T. J. Edwards preferred the coaching stamp, an active draught mare sired by blood horse, and resultant foals again put to blood sire, giving activity, endurance and appearance. Mr. J. C. Dux generally agreed with writer of paper, but placed most confidence in soundness of breeding mares rather than appearance, which was often deceptive. He contended that established farmers should never have to buy in open markets, but should always be able to produce enough young horses to keep their teams young, and the practice of selling young, untried horses was unsatisfactory from a financial standpoint. Mr. M. L. Nolan considered extremely high prices in the past were the result of extraordinary demands created by the opening up of new farming areas, and a largely artificial value was put upon farm stamps. With the return of normal conditions after the war there was likely to be a scarcity again, and it behoved every farmer to keep up the breeding of horses. Mr. C. L. Scott moved, and Mr. Dux seconded a vote of thanks to Mr. Neate for his paper, which was carried by acclamation.

#### LONE PINE.

May 1st.—Present: 22 members and five visitors.

**SHEEP BREEDING ON A FARM.**—In a paper dealing with the breeding of sheep on a farm Mr. Fritz Fromm advocated commencing with pure breeds, if in any way possible for wool as well as for market. A ram should not be used until it was two to two and a half years old, and should not be too fat when used. A ewe should be one and a half years old before being mated, and to obtain good lambs and a good

percentage it was essential to run the ewes on poor feed in order to have them in a middling condition when putting the rams with them. A young ewe should be mated with an aged ram, say 3½ years old. All ewes with blind teats should be culled for killing. A ewe from six-tooth to full mouth would produce the best lamb, but care should be taken not to breed from a broken-mouthed ewe. It might be all right in early and good seasons, but in late seasons and cold wet winters it might be very unprofitable. It was better to cull them out for killing. He advocated the mating of young ewes about the beginning of November, the ram being allowed to run with them for five weeks, which would secure a March and April lambing. For spring lambing the older ewes should be mated in March and April. It was unwise to allow rams to run with the ewes all the year round in a flock exceeding 100 sheep, because there would most likely be lambs dropped at shearing time, which would be very unprofitable. A young ram should not be used on more than 35 or 40 ewes. It was also essential to select a well-sheltered paddock (to keep off cold winds in wet weather) into which the ewes could be put when lambing commenced, because a newly-born lamb was apt to catch pleurisy. In discussion, members in general agreed with the points in the paper. In reply to a question Mr. Fromm said that he preferred in that district a Dorset Horn-Lincoln ram with a Cuthro-bred ewe, because both were excellent for wool and market.

LYNDOCH (Average annual rainfall, 23.01in.).

May 3rd.—Present: 13 members.

**MARKETING FRUIT.**—The Chairman (Mr. F. Moore) contributed a paper on this subject. He said the primary producer should consider the advisability of combining and employing trained business men to improve the marketing of the product of the land. "If fruit and vegetable production is to extend, and take its place in the feeding of the people, something must be done to reduce the cost of distribution. The usual retail profit on vegetables is 100 per cent, and fruit up to 300 per cent, to 400 per cent. Now, if we could form a combine or pool, instead of each individual selling separately and competing, the product of a district would be sold through the pool (not to it), with a keen business man in charge, whose business would be to keep in touch with the markets, the canners, and the jam makers; to advise growers which market could absorb the produce, and at what price; because, as far as I know, at present there is no market price, but each one gets what he can, or what the packer fixes for the day. But this would only help in the first handling of the goods, and it is in the retail or second handling that the big increase in price takes place; and one of the main duties of officers of the combine would be to study the retail part of the business, with the idea of advising the growers of any method of cheapening the distribution, and in advertising the food value of fruit (fresh and dried) and vegetables, and in some way what the consumer ought to pay for it. There is one method that might assist in bringing grower and consumer together, that is to obtain a system of declared value freights on the railway. When sending away goods the consigner would declare the value, and the railways collect the money at the same time that they collect the freights, and pay the consigner (at the place of booking) at the end of each month. The grower, by sending price lists and advertising, would soon get in touch with people who would be only too glad to obtain cheap goods direct from the producer without the trouble of much correspondence and forwarding of money. It would also give the packer in the market a chance to put up, say, a 1s. box of mixed fruit and vegetables, and many in the outside districts would be only too glad to have a case each week. If taken up and well advertised, it should become popular, and would also be a check on the retailer, as the packer should be able to give at least double the quantity for the same money as the retailer does at present. Another point at which co-operation is needed is in the mechanical grading and packing of apples for export. If we are to obtain the best returns for our apples, we must reduce the number of lumps, and the grading must be uniform for the State. The value of collective bargaining is well illustrated in Australia to-day. The production of dried fruits is, I think, drifting towards disaster for want of business methods in marketing. We are trying to make a living from a small output at a big price, instead of a large output at a less profit. We are producing more than is consumed in Australia, yet on account of high price restricting the quantity consumed locally. We have the Federal Government

taking action to prevent foreign countries dumping their surplus products on our markets, while we take advantage of a high duty to charge exorbitant prices to home consumers, dumping our surplus on outside markets at a loss, or else distilling. Can we grow currants at a profit against world competition? Greek currants are usually 14s. to 18s. per cwt. for second quality, 21s. to 24s. for best grades. The average production in South Australia is 1 ton per acre. My working cost for 1 acre—that is ploughing, cultivation, pruning, picking, grading, and marketing, and interest on land and plant—is £10 2s. 6d.; 1 ton of currants at 3d. equals £28—a difference of £17 17s. 6d. So I think we can afford to reduce the present price and still make a living. From 20 years' experience retailing currants I know that if the consumers can buy them at, say, 5d. a lb., they will use considerably more. Now, take dried apricots. Last year I was beaten in my own market, Gawler, by California fruit. At the recent Conference, one speaker expressed indignation at our boys at the front being fed on foreign food; but if our people asked the same price from the Federal military authorities as they asked local consumers to pay, the growers deserved to be passed by. This year I worked out the cost of handling and drying 100 cases of apricots, and found that 8d. per lb. was equal to 4s. per case fresh fruit in the garden. I see the market price is about 11d., so the home consumer again is charged the duty. Californian fruit is quoted at 8d., so that my price appears to be about a fair thing. Now, would it not be better to give home trade a chance to expand by reducing prices? The industry has grown beyond the limit of home consumption under present conditions, and if we cannot compete in the world's markets, there must before long come a slump.—Members expressed a desire that other Branches should consider and discuss the suggestions contained in the paper, with the idea of evolving some practical scheme of co-operation.

**NANTAWARRA** (Average annual rainfall, 15.90in.).

April 5th.—Present: eight members and one visitor.

Mr. A. F. Herbert gave a review of the work done by his sons in connection with the school wheat plots. Following this a general discussion took place on the methods of harvesting adopted during the year, and the many difficulties that had to be faced. Mr. J. H. Nicholls said the question of the variety of wheat was of less importance than the condition of the land on which it was sown. Dart's this year had yielded up to 40bush., and whilst Eclipse had not yielded so well, it was capable of holding its own over a period of years. Mr. Herbert expressed a preference for Marshall's No. 3, Vanilla King, and Dart's.

**NANTAWARRA** (Average annual rainfall, 15.90in.).

May 2nd.—Present: eight members.

**UNIFORMITY OF TYPE.**—In a paper under this title, Mr. E. J. Herbert made a plea for the maintenance of a uniformity of type amongst the stock of a district. In the case of cows, he said, the prevailing practice was to mate them with any bull that might be close at hand, regardless of the type or strain of the beast. He advised procuring a certain strain, and breeding from that, and by judicious culling and handling, a definite type would be established. The same applied to other lines of livestock. The combined marketing of produce, graded to a uniform standard, would be found profitable, and he suggested the embodiment of the best features of different makes into their implements.—Mr. J. H. Nicholls, in discussing the paper, thought most good was secured where there was a diversity of type, a view with which Messrs. W. Greenshields and R. N. Uppill concurred.

**NORTHFIELD** (Average annual rainfall, 19in.).

May 1st.—Present: nine members.

**ENGLISH FARMING PRACTICES.**—An interesting paper dealing with some methods of farming and the rotation of crops in the west of England was contributed by Mr. Geo. Hutchins, late of that part. The writer of the paper dealt in detail with many of the agricultural practices in England, and explained the nature of the crops grown, the methods of cultivation, dressings of manure applied, and various matters associated therewith. The paper was well received by members, and complimentary remarks were made by Messrs. D. Rowe, H. Goldney, E. L. Coole, F. Chardon, A. Sandercock, and W. J. Dall.

## SADDLEWORTH (Average annual rainfall, 19.60in.).

ROTATION CROPPING.—The following paper was contributed by Mr. B. C. Klau:—  
 "Owing to a considerable increase in the value of land and higher taxation those who are occupying comparatively small areas find that unless they crop their land with wheat every alternate year they have difficulty in making 'both ends meet.' I am of the opinion that we will have to produce more per acre than we have done in the past; those who crop with wheat every second year are doing this, but at too great a cost in loss of fertility of the soil. I admit that wheat is more suited to continuous cropping than possibly any other field crop, unless maize is admitted under favorable soil and climatic conditions. If potatoes follow potatoes year after year they become diseased, and only scabby tubers are grown; if rape follows rape, succeeding crops fail, and cow peas grown in succession become affected with worms and disease, and fail. Again, soil that is exhausted by wheat cropping will grow a good crop of oats. When wheat follows wheat certain fertilising properties in the soil are being exhausted, while others are wasted or used up by weeds, the land tends to become foul, and diseases like takeall appear in the crop. Our present method is right for a time, but as the soil loses its virgin fertility and fails to respond to good tillage, we shall need to adopt other methods. Farmers this year have said, 'What is the use of working the soil; the unworked land gave better results than the well-worked fallows; and anyway, how is the fertility of the soil to be kept up?' One way is by rotation cropping, and I will try to show how. (1) How this may be done—The rotation suitable for the wheat farmer is one in which wheat is grown alternately with a fodder crop; this means stock-raising. On small holdings of land, within a 20in. rainfall or over, crops may be grown each year, but this I do not support, because the land must be prepared in great haste, and possibly at an unsuitable time, success is too dependent on opportune rains just prior to seeding. The method I propose is that of growing two crops in three years, this permits of the stubble being used for stock feeding, and gives ample time for the preparation of the seedbed as well as allowing for the summer fallow to be in order for the autumn-sown crops. My course of rotation would be—First year, wheat; second year, stubble; third year, forage crops, these will include rape, a winter grazing crop, cow peas, a leguminous crop, and sorghum, a summer silage crop. These crops are merely examples to be varied as the farmer deems fit for his land and stock; the general principles of the rotation to be aimed at are—(1) that legumes (pod-bearing plants) be alternated with non-legumes; (2) that deep-rooting crops be grown regularly when possible; (3) that a crop suitable for conserving as silage be grown regularly, and an area reserved for it; (4) the rotation be arranged so that all autumn-sown crops are preceded by a summer fallow. The area intended to be under cultivation should be divided into three approximately equal portions; in any year one portion will be under wheat, a second in fallow, and the third under some crop other than wheat. The following table will explain the rotation:—

Year.	Paddock.	Paddock.	Paddock
1917 .....	Fallow Wheat	Stubble Fallow	Rape, cow peas Sorghum
1918 .....	Stubble Fallow	Rape, cow peas Sorghum	Fallow Wheat
1919 .....	Rape, cow peas Sorghum	Fallow Wheat	Stubble Fallow
1920 .....	Same as 1917		

(2) The advantages gained by this rotation.—I have shown how two-thirds of the cultivated land can be advantageously cropped in one year—a gain over the present system of fallowing, which only allows of one-half or one-third of the arable land being cropped each year. Under the proposed rotation four crops are obtained in six years against three or only two under the old way. Two of these crops are fodder crops, but their value will exceed that of the single wheat crop, and fertility

of the land not so reduced. With the above rotation the first three principles governing a suitable course are observed by the inclusion of fodder crops. The value of such a rotation is further increased if the order in which the fodder crops are grown is changed. For instance, if rape is cropped one year, raw peas the next, and sorghum the third. Thus nine years would be occupied in cropping the whole area before the same land carries a second crop of the same kind. These fodder crops are only types; if they are not suitable the farmer should not grow them merely because in theory such may appear desirable. The object of growing these crops is to enrich the soil with nitrogen and add organic matter to it, and prevent the ground becoming sick. If this object is achieved the variety of crop is immaterial. It may be thought that the system outlined entails more labor and expense. Such is not the case, however. Under both rotation systems the land is ploughed once for the seed bed, but with this difference, that sowing operations are completed before the ploughing, instead of after. Under the proposed system the cost of ploughing is reduced to a minimum, because done when the weather is favorable and the soil is in the best condition for such work. When ploughing has to be done first it is often delayed on account of want of rain, time becomes limited, and the work is done hurriedly, and possibly in a slovenly manner. The proposed rotation involves more work to the fallows, but this is generally acknowledged to be profitable work, and the ploughing is all done at the best time of the year. Any extra labor necessary is compensated for by getting the sowing done at the most suitable time, when it will start away, irrespective of an opportune fall of rain. At present the work of the year is crowded into seven or eight months, while under the proposed system the work is more evenly distributed throughout the year. The following calendar of operations will show this:—January, harvesting wheat for grain, working fallows; February, harvesting sorghum, working fallows; March, sowing rape, working fallows; April, sowing wheat; May, sowing wheat; June, ploughing; July, ploughing; August, ploughing; September, ploughing; October, sow cow peas and sorghum; November, harvesting wheat for hay; December, harvesting wheat for hay and grain, working fallows if suitable. The above gives full employment throughout the year, and is a step forward, as it is in the direction of securing better and more intelligent men as labor for agricultural work, and such men are now a necessity to handle the useful but expensive machinery for profitable wheat growing. The best class of men will not be induced to take up farm work if the most that can be offered them is work of a spasmodic character. I would like to sum up the advantages to be gained by this rotation method of cropping:—(1) The whole food supply of the soil can be utilised—not possible when only wheat is grown; some crops feed deeper than others, the surface feeders leaving stores of food unused. (2) The amount of valuable organic matter in the soil can be maintained, and even increased. (3) The free nitrogen of the air can be made use of. (4) Insect, fungus, and weed pests can be controlled or destroyed. (5) Provision can be made for the economical distribution of labor throughout the year."

**NORTHFIELD.**—At the last meeting reference was made to the severe loss the Branch has sustained on account of the death of Mr. J. Williams, a foundation member, and Chairman of the Branch for a number of years. The feeling of members was fittingly shown by the presentation to Mrs. Williams of an illuminated address, expressing their sympathy, and high appreciation of the late member.

**ROSENTHAL**, April 1st.—Mr. S. C. Davis read a paper on the bulk handling of wheat, in which he discussed the problem at length.

**SALISBURY**, May 1st.—The business of the meeting consisted of a "Question box," in which a number of questions were debated and decisions arrived at. It was agreed that portable engines were more suitable for farmers in that district than those of the stationary type.

**TWO WELLS**, April 11th.—Mr. J. R. Lawrie read a paper describing the methods adopted on the dairy farm of Mr. G. Lane, at Murray Bridge, which had been established on reclaimed swamp lands, though the buildings were on high lands above the reach of flood waters. The land could be flooded by gravitation, and the water was run off into the paddocks in drains and from the drains it had to be pumped back into the river. In addition to watering the land the magnesium in some of the swamp soil was in that way washed out, and lands which would

grow nothing a while ago now produced good fodder grasses. Lucerne and maize grew wonderfully, the latter producing 60 tons to the acre. The whole maize crop was put into silos, which had a capacity of 500 tons. A special binder was made for the maize, which was carted to the silos, where a cutter fitted with a self feeder and elevator was in operation. The lucerne was cut with a mower and carted to the cows. In the milking operations the product of each cow at each milking was entered on a card hung up in the milking shed, and the yield of each cow was clearly shown. Mr. Lawrie also described what he saw on a visit to the Pompoona settlement.

WATERVALE, May 11th.—For treatment of black spot on fruit trees and vines Mr. Burgess suggested spraying with Bordeaux mixture.

#### YORKE PENINSULA DISTRICT.

(TO BUTE)

DOWLINGVILLE (Average annual rainfall, 13in. to 14in.).

April 27th.—Present: seven members and one visitor.

RABBIT DESTRUCTION.—In a paper on rabbit destruction Mr. F. Lock declared that since the advent of foxes the habits of the rabbits had changed somewhat, in that they assembled in larger warrens. The pest could be kept in check by establishing a rabbit week, once a year, say in the middle or end of February, when all the landowners should be compelled to take effective means to destroy the rabbits on their properties. Such an attack would take the rabbits more than a year to recover from. Men should also be employed on all Government lands in agricultural areas in the work of extermination on the same day. As to methods of destruction no doubt the poison cart was very effective, and thousands of rabbits could be killed by that means in a day. That, however, was not sufficient, because the holes and warrens should be destroyed. Digging out holes, unless they were small, was a very slow process, but where the holes were large and the land suitable for ploughing to a depth, if the holes were ploughed in deeply in the summer, not only were the homes of the pest broken, but many rabbits were smothered in the dust. If the land were ploughed to a depth of 16in., though some of the rabbits might scratch their way out, they did not seem to be able to do much harm. Mr. J. A. Phelps had tried covering rabbit holes with straw. He stuffed straw into the openings and then put a layer of straw over all. The rabbits did not seem to be able to work in the straw, and they were successfully blocked.

#### WESTERN DISTRICT.

CUMMINS.

May 5th.—Present: 10 members and two visitors.

CARE OF MACHINERY, ETC.—Mr. A. Fuss contributed a paper on this subject. A machine was not profitable, he said, unless it provided a reasonable return after the payment of interest and depreciation. As to the care of implements, the cultivator should have constant attention to working parts, any broken or worn bolts being replaced. The draught or the springs and bridles should not be unduly heavy. A small quantity of oil should be applied to the wheels daily. Any necessary repairs to drills should have been effected before the machine had been put away after the previous year's work. When the machine was to be taken out a general overhaul was necessary, seeing that the cogs were properly in mesh. If the shoes of disks did not operate directly underneath the distributors they damaged the tubes. When ribbon tubes became jammed disconnect the tube at the top, compress it, and turn as to wind up. It generally became loose in the shoe without further trouble. To oil poles and box before a sealing will help them to resist the winter showers; raw linseed oil penetrated well, and did not spoil the effect of the original paintings. Of course, when necessary, a coat of paint would be better. The pressure springs on disks were of little use in those districts, as they were not designed to have a compression of 9in. or so, which was often required. Binder

chains and canvas should run at right tensions. Worn pitmans caused the crank bearing to jerk loose, and also broke the head off the knives if the race of the knife were worn or bent. The knotter was rather troublesome at times, usually the fault lay in the string. Too large a sheaf wore the packers and strained the binder. It was a bad practice to use resin on belts of strippers to prevent slipping, it gummed the belt, caused it to crack, and prevented slipping for only a short time. The use of castor or neatsfoot oil kept them pliable, and having the face of the pulleys crowned with leather gave better results. Gears that had a rapid motion should not be geared while travelling. All vehicles should be kept painted with good paint, and wheels well tired, and fowls kept off them. The paper then dealt with the care of engines on the farm, urging the wisdom of following the maker's instructions. A general discussion followed.

KOPPIO (Average annual rainfall, 22.45in.).

MAY 5th.—Present: seven members and one visitor.

**AGRICULTURE AND THE WAR.**—A paper under the heading of "The Effect of War on the Agricultural Industry" was contributed by Mr. F. W. Gardner. He referred to the heavy drain that enlistments had made on the number of farmers and farm employees, and dealt with the changes of the methods of handling and marketing produce that had been occasioned through the war. He closed with an appeal to every farmer to do his utmost to improve the methods of agriculture in the district, and so contribute toward the wellbeing of the agricultural industry. A lengthy discussion followed.

MILATIE (Average annual rainfall, 14.53in.).

MAY 5th.—Present: six members.

**VARIETIES OF WHEAT SUITABLE TO THE DISTRICT.**—Mr. J. W. Story, in a paper on this subject, mentioned that the varieties of wheat cultivated fell into two classes, early and late. "One of the best-known wheats in this district," the paper continued, "is Federation. It is a late, slow grower, very prolific if conditions suitable, but it is only about one year in six that everything is suitable. Being a slow grower, on old ground the young weeds tend to retard its growth. If there is 'rust' about at all Federation is affected badly. It stands up well, and shakes easily if the sample is good. J4 is a well-known wheat, more rust resisting, a faster grower, and shakes more quickly than Federation, seldom yielding a profitable crop. We have no wheats whatever that are rust-proof, except the Indian varieties Le Huguenot and Medeath, but they are not good for milling. Still, they make good hay if sown early and cut on the green side. Of milling wheats Golden Drop is the fastest grower we have. It is not very subject to rust, but very liable to shake; it will even shake before it is ripe. It also has a tendency to break off at the first knot. It is a moderate yielder. Marshall's No. 3 (late) yields a prolific crop of straw, promising a heavy yield of wheat, which the machines always fail to discover. It makes good hay if sown early on clean ground. Lotts (late) is a slow grower till spring; heavy yielder if conditions are suitable, is easy to thresh, but very susceptible to rust. Walker's Early is a medium yielder and grower. I have never yet seen it without it contained more or less smut. Of all the late wheats I prefer Yandilla King. It is a very slow grower till late in the spring. Thus on old land, where weeds are likely to come up, they grow the faster, and choke the wheat to a large extent, but for a wheat to sow on clean, or comparatively new land, it stands unrivaled. It is a heavy yielder, and stands up well. Although rust affects the straw badly, it never seems to affect the sample. It is rather tough for threshing. I might add that it can stand a fair quantity of seed per acre. Ghuyas is my favorite of the early varieties. If sown in June, with bush of seed it yields a remunerative crop year after year. To sow it in April or the beginning of May is only courting trouble. Sown early, it grows tall and has to wait long for weather to ripen it. The straw being weak it goes down and often tangles. Rust does not seem to affect it at all, but hot winds will if they catch it at any critical stage. It makes very heavy hay. King's Early is a fairly quick grower, subject to smut, takeall, and rust. Marshall's Hybrid is a fairly quick grower, and very good yielder when everything is satisfactory for it, but it appears to me to be the worst wheat we have for takeall." The discussion was

opened by the Hon. Secretary (Mr. W. E. Hier), who considered Yandilla King one of the best of the late wheats. It should be sown as early as possible. King's Early was the best early wheat for the Hills district. Mr. D. Bagnell favored Yandilla King, Guyas, and Golden Drop; Mr. W. G. Smith, Federation; Mr. J. P. Story, Guyas and Federation; Mr. E. Story, Yandilla King; the Chairman (Mr. L. J. Aunger), Yandilla King and German Wonder.

#### MINNIPPA.

March 10th.—Present: four members and two visitors.

**SAND DRIFT.**—Some of the causes of sand drift, observed Mr. F. H. Lovegrove in a paper on that subject, were (1) being unprotected from winds, especially from the north; (2) continued close feeding, through being heavily stocked; and (3) lack of moisture in drought years. Soil of a sandy, loamy nature was more subject to drift than the stiffer soils. If precautionary measures were not taken a fair percentage of the local land would have a tendency to drift as that and the adjoining hundreds became cleared, heavily stocked or intensely cultivated. To deal with a drifting area he recommended cropping it with rye, and cheaply fencing it to prevent stock, especially sheep, from running on it; the rye to be stripped and the straw left standing. The following season there should be a fair self-sown crop, well protected by the last year's straw, that could either be stripped or the grain allowed to fall, and by the middle of the following season the land should have sufficiently recovered to allow of stocking with discretion, but he would not recommend the early running of sheep over such reclaimed areas. Marram grass or lupin had been grown to advantage, and both were of great value for reclaiming drifting land, but he preferred rye, owing to the very slow process of establishing marram grass and the small use to which the lupin could be put, it being practically valueless as a fodder. The farmer or man on the land generally did not take sufficient precautionary measures to effectively deal with sand drift in its earliest stages. Mr. G. V. Lindquist said that rye was a very light yielder and difficult to strip. Mr. A. Elftson was averse to more than three cereal crops in succession. He recommended a summer scrub weed, known as the "tomato plant" for checking sand drift. It was good feed for stock.

#### SALT CREEK.

May 5th.—Present: eight members and one visitor.

**SETTLEMENT OF SOLDIERS ON THE LAND.**—In contributing a paper on this subject Mr. W. Lee, son, suggested that a paper should be written by a member of each Branch of the Bureau on this subject, and these should form a valuable guide as to the cost of starting soldiers on the land. He also suggested that those men who had not had experience in agriculture should be encouraged to farm on shares in different parts. He submitted a rough estimate of the cost of starting an up-to-date farm; the total involved being £1,403. In discussing the subject, members agreed that the practice of share farming was very valuable in enabling a farmer to start. They expressed their willingness to assist any anxious to start in their district, and the desire that other branches should take up the subject.

#### WARRIOR.

May 12th.—Present: five members.

**SHEEP ON THE FARM.**—This subject was dealt with in a paper by Mr. J. J. Doudle, in the course of which he said:—"Every farmer holding any extensive area of land should keep sheep as well as grow wheat. When starting, the farmer should go in for the best, as the good sheep eat no more than those of the poorer class. He should get sheep of a good constitution. Sheep that are constitutionally weak are always a source of trouble to their owner, and have always a tendency to yield tender wool, and a few fleeces of tender wool in a bale will often reduce the value of the whole clip. For sheep of a large frame the demand is much keener. They will eat a better fleece, give a larger skin, and realise a bigger profit in the market. In all flocks, no matter how well looked after, there are always a few small and delicate which should be culled out and sold to the butcher or to provide meat for the home. Length of staple is the next consideration. It is not advisable to attempt to grow sheep with a dense fleece until the length is first reached. Wool of long staple will always bring better prices than the short, dense wool, as density will reduce the length. When length of staple has

been reached as far as possible, then go for density, but never neglect the length for the dense wool. Once one has a good breed of sheep it is best to stick to that particular breed. The use of rams from different breeders will in time show in the progeny. For the market, taking all things into consideration, I favor the Merino. If properly cared for it will return more profit than the crossbred. The wool, in nearly every instance, brings a better price, and the sheep are much more easily kept in the paddocks."

VADNARIE (Average annual rainfall, 14.69in.).

May 4th.—Present: eight members and two visitors.

SCRUB FARMING.—A paper under the title of "Essentials in the Successful Occupation of a Scrub Block" was read by Mr. A. A. Dreckow. In discussing the question the Chairman (Mr. J. H. Kruger) emphasized the necessity for giving consideration to the questions of transport and water supply. It was necessary to adopt the practice of fallowing to assist in the clearing of the land. In using the fire rake, if the work were done against the wind a much better and cleaner job was the result. A good wide rake was better than a narrow one. As a general rule, a beginner would find it well to restrict any side lines during the first year or two to a few fowls and pigs. Mr. A. Spriggs suggested that a dam should be constructed in the centre of the block if a catchment were available, and the house placed close to this.

KOONIBBA, April 12th.—A paper dealing with the various methods of harvesting wheat was contributed by Mr. R. Schultz. As a result of a lengthy discussion the general opinion of members was that the harvester was the most suitable machine for that district at the present.

PENONG, April 14th.—A general discussion took place on the question of burning stubble, and members generally considered that by burning stubble the germinating power of the greater part of the grain lying on the ground would be destroyed.

PENONG, May 12th.—Mr. J. Stiggins introduced the question of ploughing and drilling stubble land as against drilling only, with particular reference to the present season. He advocated using the plough under present conditions, as the soil was well soaked. He thought it would be payable to cultiul the area sown, rather than to drill in a larger area without ploughing. The consensus of opinion favored the views of Mr. Stiggins. A general discussion then took place on the question of pickling wheat.

### EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BOOKPURNONG EAST.

May 5th.—Present: 15 members.

Mr. W. Hammond delivered an instructive address on the best wheats for this district. He mentioned that those which had been most satisfactory on his holding were Walker's Wonder, Yandilla King, Silver King, and Glynn. In the discussion which followed the majority of members favored Marshall's No. 3, with Yandilla King, Silver Baart, Walker's Wonder, Dart's Imperial, Budd's Early, Steinwedel, and World's Champion closely following.

BORRIKA.

April 27th.—Present: 15 members and five visitors.

Mr. Perriam (a visitor) opened a discussion by giving his experience in seedling in the mallee country. The sandy country he would not work too much. He believed in fallowing, but would not plough for immediate sowing. He preferred the disk cultivator when preparing land for immediate sowing, and he would rather "just drill" the crop in. He mentioned several instances in support of his contentions. If sandy land were worked much it required packing to form a good seed bed.

bed. He mentioned a farmer at Geranium (Mr. Norton) who ploughed his land and harrowed and then cross-harrowed it, thus making a firm seed bed, and that farmer always secured good crops. On firm land ploughing was to be recommended. In the discussion which followed Mr. E. H. Huxtable agreed with Mr. Perriam. He mentioned that land which he had ploughed and worked well was his worst in respect to yield; where he had only cultivated before the drill, was far superior, but his fallowed land was the best of all. Mr. Green's experience was that ploughing gave best results. Mr. Hart had ploughed portion of his land last season, and although that was done late, he had the best results from that land. Mr. J. B. Tonkin asked if a crop sown on stubble land fallowed would be likely to be affected with takeall. Mr. Perriam said he did not think so.

#### COONALPYN (Average annual rainfall 17.49in.).

April 6th.—Present: six members and one visitor.

**TYPES OF CULTIVATORS.**—Mr. J. Cronin addressed members on this subject. In defining the most suitable implement he said it must do good work, have an independent jump, run light, wearing parts must be few, and of the highest quality material. Price should be a secondary consideration. Many of the cheaper class of cultivators soon found their way to the scrap heap. His preference for the district was the stamp-jump twin cultivating plough. Then would come the disk cultivator, and after that the tyne implements. He considered the spring-tooth cultivators not suited to the district yet. Mr. Wall also preferred the skin plough. He contended that where the fallow had just the one working prior to seedling it was necessary to turn the rubbish under. Mr. Vennin said the disk cultivator was the best type for the district at present, as there was no choking with rubbish. There was, however, a use for every type of machine, it depending altogether on what state the fallow was in. Mr. Tregeza said one could not expect any cultivator to make perfect work on bad ploughing. The most generally useful implement for the local fallow would be a spring-draft tyne cultivator with ample clearance. If weeds were kept down by sufficient use of this implement it would not be necessary to skin-plough the fallow at seedling time, and better returns would follow.

**FEEDING HORSES.**—Mr. Wall spoke on "Feeding Horses." His motto in feeding was "good and plenty." He would let the working horse have as much as he would eat. Young horses were better fed solely on hay—any rubbish in the hay then was left out. If feeding chaff oats should be added. As a food for working horses, nothing surpassed oats. Care should be taken to vary the food at times, Green feed of some description was essential. Cocky chaff was not of much value, and no more than sufficient roughage should be put before the team horse. No amount of good feeding would counteract the harm done by habitually working horses after sun-down. Mr. Pitman said it was possible to give a horse too much food. There was little waste with hay if horses were tied up while eating. Mr. Vennin said good cocky chaff was most valuable, and with proportions of bran, pollard, and oats, made a splendid ration. Mr. Wall, replying, said many horses showed need of less whip and more feed.

#### HALIDON.

May 2nd.—Present: 11 members and two visitors.

**FINANCE OF THE FARM.**—A paper under this title was read by Mr. von Doussa. He referred to the unfortunate fact that the first crop put in by settlers along the Brown's Well line met with a year of drought, and the consequent high price of feed and seed for the following seasons. A reserve fund should be built up by every farmer, and he should also not neglect to provide a reserve of fodder for his stock. He urged the wisdom of keeping a set of accounts, to enable him to ascertain his costs of production, and also to arrive at the profitability or otherwise of his undertaking. Members generally agreed with the views expressed by the writer of the paper.

**HARVEST.**—The last harvest results were discussed. It was generally found that the heavier dressings of superphosphate were responsible for the heavier yields; the best dressing in the district was about 60 lbs. per acre. Late-sown crops yielded best, which was unusual. Bobs and Yandilla King were the heaviest yielders.

## MANTUNG.

May 3rd.—Present: five members.

Consideration was given by the members to the results of the experimental plots which had been conducted by the Branch during the year. These were as follows:—  
 Manorial test—One-acre plots, 40lbs. graded Yandilla King per acre. Results—(1), No manure, 13bush. 21lbs.; (2), 50lbs. super, 15bush. 14lbs.; (3), 84lbs. super, 16bush. 48lbs.; (4), 112lbs. super, 16bush. 18lbs.; plots sown May 16th; rainfall on plots, 13.68in. Wheat test—One acre plots, 50lbs. seed and super, per acre. Results—(1), Yandilla King, 16bush. 44lbs.; (2), Golden Drop, 14bush. 49lbs.; (3), Pioneer Purple, 13bush. 23lbs.; (4), Red Russian, 13bush. 22lbs.; (5), Federation, 14bush. 47lbs.; plots ploughed in April, and sown on May 8th; rainfall on plots, 13.77in. Manorial test on sand; wheat test on grey loam.

## MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

April 28th.—Present: 13 members and three visitors.

**DIPPING SHEEP.**—The best time to dip sheep, remarked Mr. E. Tilbrook in a paper on that subject, was six or eight weeks after shearing. The dip should be about three parts full of water. The sheep should be yarded the night before in order that they might go into the bath cool and with empty stomachs. The dip powders should be mixed with rain water in a tub, poured into the bath, and well mixed before putting the sheep in. That operation required two men, one to put the sheep in and the other to push them under the water twice, with a two-pronged fork, with the ends turned outwards, so that if a sheep got the wrong way it could be easily turned. The sheep should not be burned out of the draining pen. In the discussion Mr. Tilbrook explained that by yarding the sheep the night before dipping they would not foul the bath by droppings in the draining pen. Members agreed that it was better to dip in cool weather, because the sheep would then move about, whereas in hot weather they stood in the shade, which was not good after dipping.

**HINTS TO THE FARMER.**—All implements, said Mr. V. Braemiller, in a paper giving hints to farmers, should be thoroughly overhauled after using, ready for the next season. Coatings of paint were also unwise, and the machinery should be put into a shed to prevent the weather affecting it. All scenes of iron, &c., which were frequently thrown about could be utilised for bolts, and regarding implements, &c. The horses should have the best attention and care in regard to their feed, not only when working, but before that time arrived. Grooming should be carried out thoroughly, and horses should not be worked with a sweaty coat. When an animal was suffering from a sore shoulder it was advisable to cut the collar and so ease the trouble. Stables should be cleaned out every morning, and straw should be put in for bedding. Special care should be taken to see that the collars fitted well, and each horse should have its own harness, and a separate peg should be provided for each horse's collar and winkers. All working harness should be thoroughly cleaned and oiled twice a year to prevent it becoming hard and perishing. A straw stack should be put in the paddock after harvest in order that the stock might take shelter behind it on a cold wet night. Members generally agreed with the paper.

## MAYPOLONGA.

May 2nd.—Present: 13 members.

**MANCING ORCHARD.**—This subject was dealt with in a paper by Mr. S. W. Gray, who after dealing with the chemical structure of the tree, mentioned that in manuring the main point to be considered was that the slightest shortage of any one of the food constituents in the soil had a determining effect on the growth of the plant. "Roughly," the paper continued, ".98 per cent. of plant food comes from the air and water, the other 2 per cent. we must get from the soil. Briefly, they are made up as follows:—Nitrogen, iron, lime, magnesia, soil, potash, soda, and sulphuric, hydrochloric, and phosphoric acids. It is when the soil becomes deficient of these that we must come to its aid, and supply the shortage. That is what we call manuring. Now, of those nine substances we find that only four or five figure to any great extent in the fruit and frame of a tree; the others would be quoted in the analyses as only a trace. We are, then, finally brought down to four main plant foods, and this is what I want you to remember as the four guiding principles of manuring. First.—Nitrates, which

promote growth, and can be seen in the healthy green leaves, the large and vigorous growths, and if overdone, in coarse rank shoots, all wood and no crop. Second.—Phosphates, which promote fruitfulness, early ripening, and are most important in the soils of South Australia. Third.—Potash, which promotes the quality, the store of sugar, and general flavor that we all want our fruit to have. Fourth.—Lime, which assists in the formation of solid wood and strong branches, and is of great assistance in sweetening the soil and making the former three substances into root food. Now, these foods to be of use to the tree must be in such a form that the roots can take them up, and must therefore be in a soluble form, either in water or in the slight acids of the soil and root juices; the more soluble the quicker the tree feels the benefit. For example, take bone-dust and superphosphate. With bone-dust the soil acids and root juices slowly make available the small particles of crushed bone; superphosphate, having been treated with very strong acids before it comes into contact with the soil moisture, is much more readily available. I have endeavored briefly to show what foods are needed for tree life, and why they are so needed. Let us now see where and how we can get them, and what is the cheapest and best way to apply them. Amongst the most effective means of adding nitrogen to the soil is the application of vegetable matter in the ploughing in of green crops, or green manuring. This can best be done by the planting of leguminous crops. The growth of legumes actually increases the quantity of nitrogen in the soil; but if these legumes are ploughed into the land at the right season, they add to the land about 100lbs. of nitrogen per acre. Now this is equal to 4cwt. of sulphate of ammonia, or 5cwt. of blood manure, so should be well worth the work entailed. Turnips, vetches, cow peas, lupins, or clover are to be recommended. Now, added to the nitrogen supplied by this means of manuring is the humus that is supplied to the soil as the greens decay. The best mode of procedure is to first roll the crop, then eat it up with the disk implement, and plough it in deeply. Farmyard Manures.—Stable or horse manure is rather better than cow manure, but we may assume that the average well-rotted sample would contain about 10lbs. of nitrogen, 10lbs. of potash, and 4lbs. to 6lbs. of phosphate. The best way of treating this valuable manure is to have a compost heap. This is simply a heap of layers of earth and refuse material—animal or vegetable, leaves, sawdust, weeds, prunings, &c., dung, bone, or animal muck—covered with earth, and then another layer of refuse, earth, &c. This should be kept moist, and allowed to rot for about six months. It is then ready for use, and as well as being valuable as a manure, is particularly valuable on account of the humus it contains. The larger prunings from vines or trees should be burned, and the ashes sprinkled in the orchard near the trees; they contain valuable nitrates and potash. Should the stable dung or green manure be unobtainable, or if our trees show us they require more of either potash or phosphate, we, of course, must go to the chemical manure." The writer of the paper then detailed the recommendations made in the *Farmers' Handbook* of New South Wales for manuring different trees and crops.

#### POMPOOTA.

May 16th.—Present: 35 members.

An interesting address was delivered by Mr. F. C. Grace on "Milk and its Composition." Following the address a demonstration on the use of the Babcock tester was given by Mr. Grace, and by taking the morning and evening's milking from 12 cows, the difference in the quality of the respective milkings was demonstrated.

#### POMPOOTA.

May 23rd.—Present: 23 members.

ANNUAL REPORT.—The report of the year's work of the Branch was read by the Hon. Secretary (Mr. H. H. Orchard). After offering to the assistance rendered the Branch by visiting lecturers, the report showed that 13 meetings had been held during the period under review, the average attendance being 31.

## RAMCO.

May 7th.—Present: 10 members.

**RAISIN DRYING.**—A discussion on drying raisins was introduced by Mr. F. G. Rogers. In ordinary seasons, he said, fruitgrowers on the Murray could depend on drying their fruit by sun heat, but this year seemed one of the exceptions, when artificial heat would be necessary in order to complete the drying in many cases. Some 10 years ago they had a similar season, and in Renmark many growers had to resort to roughly-made evaporators. All that was done had been to adapt some suitable shed as an evaporating house. One grower had used his cutting shed. He had nailed bessian around it, packed the space between the wall plates with hessian, and given the whole three coats of whitewash. The vapour escaped at the ridge cap. He inverted a sweat box, on which to stand the trays, and stacked trays around the shed and one row down the centre, the whole holding 2,000 of the small trays. The five bottom trays he put the ordinary quantity of fruit on, because the drying was worst at the bottom, but on the rest of the trays he double-banked the fruit, the top trays being covered with an empty tray. The heat was obtained by 10 oil drums, each standing upon three bricks. The drums were lit in the open air, filled with charcoal, and when well alight taken in the shed. After 2½ hours it was necessary to renew the fires. The aim was to keep the temperature at 150deg., remove drums to lessen the heat, and in about 24 hours the fruit was sufficiently dried. If the fruit was only three days from the dip it was best not to double-bank on the trays. He thought in a season like this many growers could easily utilise a shed to finish their drying and save them worry. A good discussion followed. Mr. Odgers said that in 1906 he knew many growers in Renmark had adopted some such artificial heat for finishing the drying of their fruit. With present methods of rack drying and the greater distillery facilities growers might not so much need to resort to artificial drying.

## RENMARK (Average annual rainfall, 10.93in.).

April 26th.—Present: 21 members and one visitor.

**PRUNES.**—The following paper on the prune was read by Mr. J. M. Smith:—This paper does not pretend to be an exhaustive study of the prune in general, but merely records my experience in trying to grow one or two varieties of this fruit. I believe that no fruit is more widely grown or in such quantities. It flourishes in Central and Southern Europe, and also in the U.S.A., both with and without irrigation, and there seems no reason why it should not thrive and bear profitable crops in the Murray irrigation settlements. I can recall at least three considerable areas planted in Renmark in its early days, and although the trees grew well, I do not remember ever to have seen any product from these orchards, which have long since been rooted up. In looking back on our experience with the Zante currants and sultana one may fairly conclude that the prune had not a fair trial, and had it been persecuted with, as were those vines, satisfactory results might have been obtained. About seven years ago, having a piece of ground that would take about 50 trees, I decided to plant some prunes, and secured 20 trees of Prune Splendour, 10 Prune D'Agen, and 20 Coe's Golden Drop, understanding that it was desirable to include this variety in a prune orchard for the purpose of cross pollination, and knowing that there was a market in Adelaide for the fruit dried. The soil is a red loam, averaging about a foot in depth, and covering a layer of hard pan varying in thickness from 1in. to 6in. The holes for planting the trees were all sunk well below the hard pan. The trees were planted 18ft. apart, and made growth from the start. For three years they were cut hard back in the winter, since when they had very little pruning, and have developed into fine vigorous trees. In the fourth year the prunes bore a very promising crop. In the next year—(1915)—the bad year for most fruit crops, they also failed. They bore well last year, but this year only moderately. The Coe's Golden Drop have been disappointing. In the first place only 12 of the trees were true to name, and they have proved to be very shy bearers, and I imagine are not fulfilling the purpose for which they were planted, as they are a week or 10 days later than the prunes in flowering. The fruit is fine and large, and for drying when ripe should be dipped in boiling lye (about 20 to 1) spread on trays, and put straight into the sulphur house, and sulphured to about the same extent as for dried apricots or peaches; and then put in the sun to dry. When finished it makes a fine attractive looking fruit, but it is by no means a prune. The Prune Splendour is one of Burbank's productions, and is a

cross between the Prune D'Agen and Pond's Seedling. It bears a fine, large, dark purple fruit, which ripens early in February. Gathered and placed on trays in the shade until wilted past all danger of sun blistering, it will dry without dipping or pricking, and when finished off makes a very handsome and fine-flavored prune. The Prune D'Agen ripens late—about the end of February—and to ensure drying in reasonable time requires either dipping or pricking. I prefer the latter, having found, as a rule, that the dipped fruit has a rather rusty appearance when dry. To finish them off and give the dark glossy appearance it is necessary after the fruit is dry and evened up in the sweat box to first wash it in boiling water, and after draining dip in a syrup, which may be made in many ways. The following is a syrup that will give satisfactory results, and is perfectly wholesome:—10lbs. prunes, 5lbs. sugar, 2ozs. salt, boiled in 20galls. of water. When the ripening period approaches every high wind will bring down a quantity of fruit. This fruit is worth picking up, as a rule, and putting out to dry in the usual way. It is a good plan to go round the orchard about once a week at this period and shake off the ripe fruit on to hessian. Many years ago, in conversation with the Hon. T. Playford, who had just returned from England by way of America, the subject of fruitgrowing was touched upon. He said one thing that had made a great impression on him was the enormous area of land on the Pacific coast devoted to prune growing. There is little doubt that we should be able so to prepare our fruit as to give satisfaction to the trade if we can only get the trees to bear. This may perhaps be achieved by judicious pruning. Last year my Prune Splendour averaged 5lbs. dried fruit to the tree, and the Prune D'Agen 19lbs. per tree. The market price rules somewhere about 8d. per lb., and with 120 trees to the acre the Prune D'Agen would give a fair return.—The reading of Mr. Smith's paper evoked a general discussion on its subject. The Chairman (Mr. Basay) remarked that Mr. Smith was not the only Remark grower who had been badly treated by nurserymen. Members generally were eager for information about the sugar prune, of which there are apparently no trees in bearing in Denmark. Mr. Taylor was very hopeful that the sugar prune would prove well adapted to river conditions. The fruit was not of the finest, but coarse-grained and large-stoned, but the sugar content was very high, and it had the reputation in California of being a very heavy bearer. It had also the advantage of being an early ripener. Trees of this variety were planted in Mildura some 13 or 14 years ago. He had not seen these, but they were reported to be bearing well. A larger experience of the Splendour was needed to prove its adaptability to the conditions of the irrigation settlements, but Mr. Smith's experience of this variety was not encouraging, and it was significant that down-country growers were reported to be now fighting shy of the Splendour, on account of its light-bearing habit. A few years back this variety was prime favorite on account of its excellent quality and its early ripening character. Mr. Kidd stated that a successful prune grower in Mildura had advised him to plant the Prune D'Agen, Sugar Prune and Prune Splendour. Mr. L. Pitt said he had a number of Prune D'Agen trees, but got very little from them. There was no other variety planted with them, but failure to bear could not be for lack of facilities for cross pollination, inasmuch as the trees failed to flower. Mr. Taylor said that although Mildura experience of the prune had been very similar to that of Remark in the early days—most plantations failing to produce profitable crops—two prune orchards in that settlement had yielded very handsome returns over a long period of years. In one case the trees were planted on stiff bluebush soil and in the other in a rotten bluebush hollow, where the soil was heavy but very fertile. In the former case the prunes were all of the D'Agen variety, with a few trees of (he believed) Cox's Golden Drop, which probably aided the setting of the fruit. In the second case (Mr. Faulkner's) the trees were of the D'Agen and Fellenberg varieties. Fourteen years ago Mr. Faulkner told him he was making £50 an acre from his prunes, and when he last visited Mildura the same gentleman assured him that he was taking £80 an acre off his Prune D'Agen and £100 an acre off his Fellenberg. At that date none of the trees had been cut back for 12 or 14 years. Hard pruning was undoubtedly one of the early reasons for the unfruitfulness of the prune on the river. He was personally acquainted with one plantation of Prune D'Agen in Mildura the trees of which always flowered prodigiously, but only bore very occasional crops until the place was sold to a man who let the trees go without pruning. He had been rather surprised to find from the latest edition of Wickson's California Fruits that, in spite of the many improved varieties of

prunes introduced of late years, the French Prune D'Agen was still prime favorite with Californian growers. Mr. Petersen said he knew one tree in Bonnmark which always bore very heavily, and Mr. Taylor said that Mr. W. R. Lewis, of Girri Girri, had had similar experience. The Fellenberg was undoubtedly a good prune for the river. Both Mr. Smith and Mr. Pitt had found the dipped prune dry as quickly as raisins, and Mr. Bassey said that the Splendour appeared to dry very well on the tree. Mr. Smith said this was so; he found it quite unnecessary either to dip or prick the fruit of this variety. Samples (a carton of each) of his French and Splendour prunes and of Coe's Golden Drop dried plums were tabled by Mr. Smith. They were all of fine quality, though the D'Agens lacked somewhat in blackness of color, and he was heartily congratulated on them. The Splendour—large, fleshy, and jet black—was especially admired.

#### ROSY PINE.

May 2nd.—Present: 14 members and one visitor.

**PIGS ON THE FARM.**—A paper on this subject was contributed by Mr. J. F. O'Loughlin, who expressed a view that these animals should form a part of the livestock on every holding, and he recommended purchasing from a breeder of repute. The sow should be of the Berkshire breed. Suckers should be reared to an age of eight months. They should have a first litter by Berkshire boars, be given a spell of, say, three months, and mated with the Middle Yorkshire. The sow that was about to farrow should be put away by herself, be given some clean, dry straw, and be fed lightly. After a successful farrowing the boar should be put in with the sow without loss of time. When rearing young pigs it was necessary to be particularly careful that they were not allowed to become hungry. Porkers should be fattened to about 60lbs. to 70lbs.; baconers, 120lbs. to 180lbs. The man who was disinclined to breed these animals was best advised to purchase stock six weeks old. In discussing the question Mr. L. Vaughan recommended soaking oats to pigs. Mr. Lee thought the animals could be profitably reared when allowed grazing. Mr. Hay considered that pigs being bred for the fat market were better sty fed.

#### WYNARKA.

May 5th.—Present: 15 members and two visitors.

**HOW TO MAKE FARMING PAY.**—Mr. A. W. Lawrie contributed a paper under this heading, as follows:—"When I came up here a few years ago, I thought that all we needed to do in the mallee country was just to scratch the land over a little and drill in the wheat and get a big lump of land in. This kind of cultivation might do for the first crop of new land, where it had had a good burn over it, but I have come to the conclusion that it is much better to cultivate the land well, and put less in. Scratching the land in year after year will not pay. I do not think we ought to crop our land with wheat for more than two or three seasons in succession. If it could be done, I would advise two crops and then a rest for one year. Plough the land not more than 23in. or 3in. deep when ploughing to year. Before drilling in the wheat go over the land with a cultivator of some kind or harrow it, and then the drill will cover the seed much better. I also recommend harrowing after the drill. Forty pounds of wheat and 60lbs. of super, per acre is about the right quantity to use. Fallowing ought to be done as soon after seedling is finished as possible, and not later than the middle of September, as it is likely to be getting dry by then. Plough say 4in. or 41in. deep, and if any weeds come up on the fallow, it should be scythed or harrowed; but better still, feed it down with sheep. Every farmer ought to grow his own mutton, and it would pay to have, say, 20 acres of land sheep-proofed and divided into, say, four paddocks of five acres each, and put it in with oats or barley. This would carry probably 30 or 35 sheep. The sheep could be changed from one paddock to the other, so that would give the stuff a chance to grow. Every farmer should have a few pigs, also fowls, and a cow or two. Experience has taught me that to be successful one must work the land well, not be too anxious about putting in a large area, but whatever one does should be done well, and with an average season farming will pay."

BERRI, April 10th.—Mr. F. Arndt continued his paper on experimental irrigation, showing the great need which existed for continuous experiments. In discussion members recognised the need of the experiments, but expressed the opinion that they should be undertaken by the Government, because they were too costly for private individuals.

LAMEROO, April 7th.—Mr. R. A. O'Connor delivered an address on the bulk handling of wheat, dealing with the question from a farmer's point of view.

MURRAY BRIDGE, February 26th and April 2nd.—At the meetings held on these dates Mr. D. F. Laurie, the Government Poultry Expert, delivered addresses on the general purpose of fowl, and raising and feeding fowls.

MYPOLONGA, April 4th.—Mr. Muspratt delivered an address on horticultural matters, which was very well received.

ROSY PINE, April 11th.—Mr. Lee reported on the experimental plots; the crop was very light.

#### SOUTH AND HILLS DISTRICT.

CLARENDON (Average annual rainfall, 33.67in.).

May 7th.—Present: seven members and one visitor.

SHEEP ON THE FARM.—"I was asked to write a paper on sheep as scavengers on the farm, but admitting that they help to keep the weeds and rubbish in check, I do not approve of the policy of starving the sheep to make them do the work the team should do," said Mr. A. Phelps in a paper on this subject. Sheep were no longer looked upon merely as a sideline in farming in the hills. The question which confronted the smaller holder was, would it pay to establish a flock at the present prices? He said, emphatically, yes. If they had to pay, say, 35s. for a good ewe, the lamb and fleece would about return the amount the first year. As the class of sheep required was almost unobtainable at the present they must resort to breeding. The basis of the flock should consist of South Australian Merino ewes, and cross these with the Longwool breeds in English Leicester, Lincoln, Border Leicester, and Romney Marsh. The Lincoln-Merino cross seemed to be the most popular in that district owing to its large frame and heavier fleece, which was transmitted to its progeny; but as it was slow to mature, and the carcass was coarser and inferior in quality, it was unsuitable for export. Its large head, also, increased the danger of losses at lambing, especially with young ewes. He expressed a preference for the English Leicester-Merino Cross; then, having decided to raise fat lambs, one could cross with the shorter woolled animals, Southdowns, Shropshires, or Dorset Horns, preferably the first-named. When replenishing the flock, one should go back to the long wool or Merino rams, to keep the flock and wool of a uniform type. Fodder crops should be grown for the ewes and lambs. Lucerne, early-sown rape, rye, Cape oats, in rotation made good fodder. None of the cults, especially of the short-woollen type, should be retained. The lambs should be tail'd at six weeks, a sterilised knife being used, and ears taken to see that they were not turned into a dirty yard or with the flock. They should be kept on their legs, and should have their mothers when turned into the paddock.

EXHIBIT.—Mr. H. C. Harper tabled a long red mangold, grown on land that had produced, in addition to the mangold, two crops of green fodder within 12 months.

HARTLEY (Average annual rainfall, 15in. to 16in.).

April 4th.—Present: 12 members.

VISIT TO VICTORIA.—In a paper dealing with a recent visit to Victoria, Mr. F. Lehmann said that in that State the reaper thresher was more in use than in South Australia. It was claimed that it ran more straightly after the team, and would deal well with rubbish and work in damp weather, besides making a splendid sample. In the rougher mallee country where the stripper was used the motor winnower or horse treadle winnower was used. In filling the bags the patent bag filler was in common use, and the bags could be quickly filled to bursting point. The wheat was weighed over a weighbridge, and the farmers were satisfied with the weight. Oats were largely sown as a rotation crop to prevent takeall. He saw a stack of oats straw that had contained 700 bags of oats. It had been threshed by

a thresher which required 14 men to work it. A smaller stack had been threshed by a reaper thresher, requiring only five men to work it. The latter machine did equally as good work as the larger machine. That type of machine would suit that district if it were not quite so cumbersome, having a 9ft. cut, which was too heavy for that locality, but would be very useful to thresh oats, barley, or wheat and put by the straw for fodder during droughts. In the district he visited there was a large distribution of water by open channels to supply farmers with water. The farmers received their supplies in dams from 1,000yds. to 2,000yds. capacity, and most farmers had a windmill erected at those dams to supply house and garden with water, and it was a pleasure to see the flourishing fruit trees and vegetables grown as a result.

**BUILDING HAYSTACKS.**—The first essential in building a haystack was to procure some nice handy forks, remarked Mr. F. Pope in a paper dealing with that subject. A bad fork meant less work, and that was unprofitable. The best place for a haystack was on level ground. If that could not be found it would be necessary to build two or three layers higher on the lower side. That would keep the stack from settling down the hill. Old posts or boughs made a good foundation, but a good pile of straw was better, since it tended to keep the rats and mice out. A fork should be used to build with. It was better than the hand, and it was not necessary to tread the outside sheaves. In building it was impracticable to work all round the stack, but the operation should proceed from side to side. All the sheaves should be laid the same way, straight across the stack, binding the layer on the opposite side with the butts, taking care also to bind the ends well. The middle should not be made too high until roofing was commenced, and then it could be filled up. In commencing the roof one row should be laid out about 6in. to run the water off. Then, by binding with the butts the outside sheaves could be given a good dip, sufficient to keep out a winter's rain in most seasons. It was impracticable to build too wide, and it was a better plan to build higher or make the stack longer. If the stack were a small one and ran up quickly the walls should be fairly straight, because they would give out as the stack settled. If the stack were a large one it would be as well to give it the outward leaning desired, because it would remain as made, except that the ends would squeeze out so that it would be necessary to be careful not to allow them to project too much.

#### MOUNT BARKER (Average annual rainfall, 30.93in.).

April 4th.—Present: 40 members.

**Sheep.**—After setting out that "sheep" was too large a subject to be dealt with exhaustively in the limits of his paper under that heading, Mr. O. P. Lines said that he would restrict his remarks to two classes, viz., Merinos and a cross for mothering lambs for "freezers." There were, he said, several types of Merinos, viz., Tasmanian, New South Wales (known as the Vermonth), Victorian (known as the Wanganelia), and the South Australian plain body. The two former were almost identical, carrying a fine quality of wool very dense, usually short in staple, and a carcass on the small side, covered with wrinkles. Sheep carrying excessive leather did not thrive as well as the plain bodied animals, and the wool being fine taxed the constitution to keep up the supply of yolk. Fine wools generally carried more yolk than coarse, and when hardship came, as a drought for instance, they had dead yolk and tender fibre as a result. The Victorian Wanganelia recently introduced into South Australian flocks was a very attractive sheep, and carried a nice quality wool, good staple, evenly distributed on the carcass. They were slightly more wrinkled than the South Australian plain bodied sheep. As a result of breeding sheep with excessive wrinkles many fine and tender wools had been produced. In breeding Merinos he recommended the "plain body." They carried a coarser wool, but coarser wool meant stronger constitution, and where sheep had to rough it somewhat, constitution was the first consideration. They were more largely framed, big boned, and having coarser wool must of necessity have coarser skin. But the strong, bulky, coarse wools were always eagerly sought after, and commanded a high price, because when scoured they gave a higher percentage of wool. In purchasing for breeding he recommended the selection of ewes with not more than two folds on the neck, large frames, and carrying a nice even fleece with plenty of bulk. Having selected ewes of that description he could not attach too much importance to the selection of the ram. In all cases it was wise to know a sire's breeding for at least two generations, because some animals were very attractive to the eye,

without any breeding at all, and when used have disastrous effects on the flock. In that way years of care were wasted. A good sire with an even bulky fleece would build up the flock with bulk, and in the laws of nature ewe lambs followed the sire. Afterwards, if weight were required, a weighty woolled sire with plenty of lustre should be selected. In purchasing a sire £1 or £2 in price should never be considered, because a good one was cheap at £5, whereas a mongrel was dear at a gift. Under those headings, with a little care he had seen flock raised to such a degree that two years ago 500 of them returned 16s. per head in wool alone. In breeding a mother for lambs to freeze it should be remembered that Mount Barker was too wet for Merino sheep, generally speaking, and as the holdings were small it was essential that the flocks should be restricted to a certain number, excepting in the spring. A lamb usually could be bred for half the cost it could be bought, and with a little feeding in winter and a fair lambing the flocks could practically be doubled for the period mentioned. The question then was what were they going to keep? He recommended a Comeback in the opposite way to that usually adopted. In selecting the breeding ewes for the farm regard must be had to wool production, although mutton was a big factor, and therefore the Lincoln-Merino cross was the ideal for wool and mutton combined. A pure Lincoln ewe (or as pure as possible) should be selected, with large frame and well covered, and should be mated with a large framed Merino ram, with plenty of quality, good staple, and robust constitution. The ewe lambs resulting from that combination should be kept for breeding, but any bad wools should be culled out and sent to market. Those which were retained should be mated to a Merino ram such as described above, and they would have to all appearances a Merino, hence a wool producer, carrying a bulky, weighty fleece, which would comb between 56 and 60—a wool fairly rushed by buyers, and commanding the highest prices. That class of sheep was practically a New Zealand "Corriale," and all knew how their wool and mutton were sought after. He preferred that cross because the Lincolns were the coarsest and largest of the English breed, the latter playing an important part in the size of the ewe lamb which they were now considering for a mother. Those mated to a Shropshire ram produced an ideal lamb for "freezers." The Leicester carried a finer fibre, but the cross with the Merino in the former case produced a finer fibre, and still retained the size of the Lincoln. In a district with over a 20in. rainfall it was advisable to keep the Lincoln-Merino cross; if less than that rainfall Merinos would do better. A hard and fast rule could not be presented; for instance, if the climate were mild and pastures hilly and well-drained the rainfall might be raised an inch or two. In the discussion which followed members were unanimous in their agreement with the views expressed in the paper, which they declared were ideal for that district.

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#### MOUNT BARKER (Average annual rainfall, 30.93in.).

May 2nd.—Present: 52 members.

**FENCING.**—The following paper was contributed by Mr. Hollamby:—Throughout the Hills districts, where mixed farming is the rule, it is essential to have good fences, especially boundary fences. Our first consideration is to ascertain the length of the fence to be erected. Then, to find out the nature of the land over which the fence is to be erected. If swampy, stony, or sandy, this makes, or should make, a considerable difference in the class of timber to be used in the fence. We will suppose, for instance, that it is mostly fair agricultural land, with an occasional stony ridge, and a creek to be crossed. Having red, blue, mountain gum, and stringybark, all of which are used in the hills, to select from, I take blue gum, as I have noticed that red gum is more often affected with dry rot, and consequently will break off at the surface when so affected fairly readily. If you take red gum, avoid timber that has been rung any length of time, or young sappy stuff. For splitting you need a good maul and set of wedges. Keep powder as far away as possible, as it is almost sure to shatter some post a little, thereby weakening it. Of course it would pay sometimes to put a charge in a log to open it. Should it be a very tough one it saves time. To make a good substantial fence, say 3ft. 10in. high, the posts need to be 1ft. 10in. to 2ft. in the ground, therefore the posts should be 5ft. 10in. to 6ft. in length. Split posts 7in. x 3in., free of sap, will last a lifetime under ordinary circumstances. In sawing off logs, be a splitter ever so careful, the saw will sometimes run a little out of true, leaving

a long and short side to the log; or there may be a bend in the log. If this occurs the short posts and long ones should be placed in separate heaps, then when they are carted on to the line those which are a trifle long should be placed in a hollow, and those a trifle short should be placed in stony patches or on any sudden rises in the ground. If this is duly noted much hard sinking is often saved. If possible split all posts some time before they are required. This gives time for the sap to run out; also green posts rust the wires. Strainers should be cut from dry curly limbs if possible, not less than 1 ft. in diameter at the small end. Corner strainers should be 7ft. 6in. long, and line strainers 7ft. These can often be cut from limbs of the trees fallen for splitting posts. Also a long post or two required for supports in crossing a creek may be cut from same. Having fully prepared the posts for the fence, clear the line of all overhanging timber, as this will save a good deal of trouble later on. Also clear all undergrowth as prevention against fire. The line can then be pegged roughly as a guide in carting the posts, which should be dropped at equal distances, not more than five in one heap, allowing about 45ft. between the heaps. This leaves about 8ft. between the posts. Do not cart strainers until you have made a good start at the fence, as it sometimes happens that by going a panel or two farther, or dropping one, it will save some hard sinking. Put up the posts as you sink the holes, as this prevents rubbish from accumulating in the holes. If the fence is being erected over an old line avoid putting the posts in the old holes without clearing them out thoroughly, as white ants have probably collected in the old butts, and they very quickly will spoil the good posts. Cut a stick 8ft. long for measuring, and take your measure from end to end. In sinking the holes allow plenty of space for the rammer; be careful that no leaves or rubbish get in with the earth. See that all posts are well rammed, especially strainers. Avoid making strains shorter than absolutely necessary. On even grades eight chains is close enough for strainers. See that the fence runs in as even a grade as possible. This can be done by raising it a trifle in sudden dips in the ground, and by dropping a trifle on short bumps. Keep posts as near to the upright as possible when putting up, for they will get out of the perpendicular quickly enough. When posts have been erected bore them with a  $\frac{1}{2}$ in. bit for plain wire and 13in. for barbed wire. Mark the posts from the top. This is a good gauge for both sheep and cattle—Barb 2in. from top of post, 1st plain wire 10in., 2nd plain 9in., 3rd plain 8in., 4th plain 7in., 5th 6in., and bottom wire 6in. from ground. To make an extra strong fence raise the barb on top. The remaining five should be No. 6 gauge. To run barb wire place the coil on an ordinary spinning jenny (without the pegs), being careful not to undo an end beforehand. Now open the end of the wire and splice 5ft. of plain wire for convenience in handling. Strain the barb wire before putting in the other wires. It is always better to strain the top wire one strain ahead of the others, as this will save straining line-trainers. Do not use more over-ground struts than necessary. Where over-ground struts are used care should be taken to have struts a good length, as short ones tend to lift posts. The best place for the strut is under the second wire at strainer, reaching back to the bottom of the next post, which would mean about 9ft. Strain all wires tightly, but it is possible to over-strain, especially barb wire, which begins to turn around when over strained. As soon as this is noticed stop. After plugging wire pull the straining jack off quickly, and bring the loose end of wire round the post. Do not use the hammer in bringing the wire round. The approximate cost of a fence of this kind at the present time would be £65 per mile. For division lines a much lighter fence than that described would suffice. I prefer wooden posts 24ft. apart, with two droppers between, thus leaving 8ft. between supports. Use barb wire 2in. from top, four plain wires (No. 8 ordinary or No. 12); height of fence 3ft. 6in. The following is a good gauge for this fence—Barb 2in. from top, 2nd 11in., 3rd 10in., 4th 8in., 5th 7in., and bottom wire 6in. from ground. If hank-breeding is carried on use wire netting, or something similar, between grazing land and cultivation plots. When the wire becomes slack, undo it at the straining posts. Cut off the piece of wire that was fastened round the post. Fasten the straining jack on, pulling the wire as tightly. With care no extra wire need be used. It is always a good plan to strain wires in new fences at the end of the first summer after erection, as it will help to lengthen the life of the fence. If a wire is broken, always undo it at the strainer and pull it up by means of the jack. It does not pay to twist a wire up with sticks. If posts are broken off it pays best to undo the wire at the strainer,

put in a new post and bore and run the wires through. On no account staple wires on to posts, as this interferes with straining later on, and gives a fence a patched appearance. In bringing this paper before you I have confined my remarks to the hills and settled districts, knowing full well that fences such as described would not pay to erect on large wheat areas or on pastoral lands "out back," where "make-haste" fences serve the purpose equally well, and can be erected for about half the cost.

NARRUNG (Average annual rainfall, 17in. to 18in.).

April 28th.—Present: 21 members and one visitor.

BOOKKEEPING ON THE FARM.—Mr. W. T. Lawrie submitted a paper on this subject, in the course of which he said:—It should hardly be necessary to emphasize the fact that for the successful pursuit of any business bookkeeping is imperative. The farmer's business is a somewhat complicated one, embracing as it does several differing lines. There are some who jog along somehow, with only the heel of a cheque book and the pass book to show their financial position. We read of farmers becoming bankrupt, and any person who reads the evidence taken in the Insolvency Court knows that in nearly every case the insolvent does not keep proper books, and it is an exceedingly rare occurrence to find a farmer who has been in the habit of recording all his financial transactions among the bankrupts. There must be some connection between the two, for when bad seasons, bad health, or bad luck comes along it seems to be the methodical bookkeeping farmer who is still able to weather the storm, while disaster comes to the other. A farmer should keep strict accounts, not only for his own information, but for the sake of his family. He takes a variety of risks in his vocation, and should sickness, disablement, or death remove him from the supervision of the business, his books should show his family or executors just how things stand. It would also be of great advantage to have the elder children (if any) to assist in recording accounts. For instance, it might be arranged that one should keep the dairy book, another the poultry, and so on. These separate accounts for separate branches being kept under the farmer's supervision he would then only need to summarise and enter the results in the general book. Then in case of his sickness, instead of things getting behind, and giving him no end of worry later, he would find no difficulty in getting going again. He will find it advantageous and very instructive to have an account kept for each of his operations, then he would soon discover whether it was worth his while to continue some of them. If he set aside a definite time each day or evening to be allotted to making the entries, it should not take more than a quarter of an hour. Do not put off making an entry. A couple of minutes at the right time will save half a day of brain searching later on. During the course of his paper he demonstrated the method of using a simplified form of bookkeeping, and in closing suggested (1) The making of the balance each quarter. This will lighten the task at the annual balance. (2) Give the wife and children a share in the work. (3) Get the wife to keep a book showing everything withdrawn from the farm for domestic use. (4) Do not neglect to enter every little expense incurred on behalf of the farm. Mr. Hackett agreed with the writer of the paper and the necessity for systematic bookkeeping. From experience he could speak of the benefits to be derived from such a course. He then described the correct method of treating stock as a separate profit and loss account. Mr. Lawson expressed appreciation of the paper, and upheld statements re necessity and value of well-kept books of account. He referred to records of Insolvency Court and difficulties experienced by those who could produce no proper records.—Mr. Goode then dealt in an able manner with the preparation of income tax returns. By means of enlarged copies of the return form he showed how each section should be dealt with, and explained away many of the difficulties which confused the farmer in his preparation of the return. He explained the words "standard value," and gave the standard values as follows:—Pigs, £2; sheep, 10s.; cattle, £5; horses, £7. The values were to remain fixed for the purpose of the return. In concluding Mr. Goode mentioned some of the difficulties and errors that had come under his notice, and promised help to any who were in doubt. At the end of his interesting and instructive effort a few questions were asked. The clearness with which the subject was handled left little need for further explanation.

## PORT ELLIOT (Average annual rainfall, 20.335 in.).

April 21st.—Present: nine members.

**SUBDIVISION OF A SMALL FARM.**—In the southern districts, remarked Mr. Jas. McLeod, in a paper on the subdivision of small farms, the average holding varied from 100 to 500 acres. Very few had the latter area, the average being about 200 acres, so he would deal with that sized farm. Areas being limited, the landholders were not what were generally termed wheat farmers, but practised mixed production—a little of everything—such as dairying, pig-raising, sheep, poultry, fruit and vegetable growing, &c. In regard to dairying, on a 200-acre farm, it was rather difficult to gauge the carrying capacity of the south lands. Some, near the sea coast, would carry nearly double the stock the hills would, and therefore it was necessary to strike an average. About 15 cows, one bull, rear four calves, four horses, 50 pigs, and 50 hens would be the stock which should be put upon 200 acres. Should the land be fairly level he would subdivide 160 acres into 10-acre paddocks (of course that would have to be done gradually). At first he would cut the 80-acre blocks into two, then divide again, and so on until the 10-acre block was reached. The remaining 40 acres would be the homestead, with the necessary surroundings, yards, stables, &c. Should the land and position be favorable, he would plant five acres of orchard. At the back, and not too far away, he would make four one-acre pig paddocks. Experience taught him that they would do much better in small paddocks than in sites. If the land were poor and sandy they would soon enrich it. He had seen poor sand, so treated, produce splendid pastures. The cows should be Jerseys, or Jersey cross, mated to pure Jersey bulls, because the farmers were not milk suppliers, but cream and butter producers. He would have two draught mares and two stout buggy horses, strong enough to take the side of a plough, binder, or drill. He would breed a foal every year by the best draught stallion to be procured, using each mare every alternate year. A good draught yearling would always bring a payable price, providing it was of the right stamp, and well kept. He preferred the short-legged, big-bodied compact horses, because they were much easier to keep in condition, and always looked better than the long-legged animal, and brought a better price in the market. To get the 50 pigs mentioned, he would keep four sows and one hog of Berkshire breed. Two litters every year from each sow would easily give the 50 pigs. On these small farms they could not afford to fallow, land being too dear, therefore they must make use of every acre; consequently he would recommend growing peas instead of fallow, and would put in 10 acres in May and 10 acres in July, also 20 acres of hay, 10 acres of wheat, and 10 of oats. That acreage, in an average season, would give ample fodder and grain for the before-mentioned stock. These crops should be grown in rotation, and all grain and hay be consumed on the farm and converted into cream, pork, and eggs. Should the land be hilly he would recommend a few small paddocks in the gullies down to limestone. It would grow a lot of feed in the summer, without irrigation, if the land were at all damp; and by having small paddocks the stock could be changed from one to the other, and it would carry more than double the stock, used in that way. After some slight discussion Mr. McLeod, in reply to a question, said that he would cultivate 60 acres every year.

**CHERRY GARDENS.** May 1st.—The meeting was held at the homestead of Mr. C. Ricks, and general pleasure was expressed at the appearance of the place, the orange, vegetable, and fruit gardens being inspected.

**Pests.**—Members reported the appearance of mice, which were doing damage to haystacks, vegetables, &c. Slugs were also making their appearance. Messrs. Ricks and Chapman both reported the appearance of woolly aphids, which appeared to develop most rapidly where the limbs had been removed in pruning, and in rough places on the bark on some trees; more particularly Dunn's Seedling.

**FOREST RANGE.** May 10th.—An address on the question of cold storage of fruit was delivered by Mr. G. A. Dunn, who outlined the system of co-operation as practised in Victoria, and gave an interesting account of a recent visit to the fruit-growing districts of Tasmania.

**HARTLEY.** March 7th.—Mr. F. Clark read a paper on the selection and treatment of seed wheat, in which he advocated careful grading and cleaning. If that were not effective in removing all barley, the farmer could, when the crop came up,

pull out all the barley. Though that seemed a laborious and expensive process, after one or two seasons he would be rewarded by having clean seed. He advised pickling the seed every year in a solution of  $\frac{1}{2}$ lb. of bluestone to 10galls. of water. The solution should be placed in a cask and the seed tied in a bran bag and immersed in the solution until it was well soaked. A discussion ensued, and members generally endorsed the views set out in the paper.

MILANG, April 14th.—SEEDING OPERATIONS.—This subject was dealt with in a paper by Mr. William Perry. A noticeable feature in the discussion was that farmers on rich alluvial soil and those on poor sandy scrub country maintained that the best results were secured by sowing 40lbs. of wheat per acre. Farmers on good agricultural land recommended sowing a bushel, and sometimes more per acre.

MILANG.—In the presence of 35 members and 15 visitors the Principal of the Rosworthy Agricultural College (Mr. W. J. Colbatch, B.Sc. (Agric.), M.R.C.V.S.), delivered an address dealing with the rearing of early lambs for market, and the feeding of sheep.

PONT ELLIOT, May 19th.—Consideration was given to the question of keeping more livestock on the farm. Mr. Green mentioned horse bean as a good fodder, which should be sown about August in that district. Mr. Hargreaves reported having sown that crop in August, after having dug early potatoes. The result was a crop equal to 40bush. per acre. He recommended *phalaris commutata* as one of the best grasses to be grown in many parts of the district.

STRATHALBYN, May 8th.—A general discussion took place on the ravages of mice, and the trouble occasioned through foxes and rabbits, and a paper from the *Journal of Agriculture* on "The Sanitization of the Farm" was read.

### SOUTH-EAST DISTRICT.

GLENCOE (Average annual rainfall, 33.84in.).

February 26th.—Present: 15 members and two visitors.

BARLEY.—In that district it had been usual to grow barley after potatoes, said Mr. E. A. Telfer, in a short paper, but as potatoes were not now grown to the extent that they formerly were, land that had the previous year carried that crop was not always available. It then became necessary to fallow the land in the summer, and keep it well clear of sorrel and other weeds. It was not a good plan for one barley crop to succeed another, but if an oat crop were grown between, the second barley crop would return good results, but it was best to fallow the land after harvest. Have the ground ready, get good clean seed, and pickle, using 1lb. bluestone to about 8bush., and drill in no more than 1bush. of seed to the acre, about the end of July or the beginning of August. It is not necessary to use manure on the heavy land after potatoes, but would advise putting a little manure on other land, say about 50lbs. to the acre. If we have a lot of wet after the barley is sown, and the land gets caked, I would harrow to loosen the surface; if dry, I believe in rolling the crop. If the farmer wants the straw, which is a valuable standby for cattle in the winter for feed, he will have to cut the barley with the binder, and stack and thrash it, otherwise he will use the harvester or reaper-thresher. With the scarcity of labor, as at present, the farmer saves a lot of work by using the harvester or reaper-thresher, as he can take off his crop without assistance." Mr. M. D. Cameron used 4lb. bluestone to the bag of barley, steeping in a cask, and had found it effective against smut. Mr. T. Gratwick had sown barley on grass land, using 100lbs. of basic slag per acre, and had a yield of 41bush. per acre. For pickling he used 1lb. bluestone to 8bush. of seed. Mr. H. A. Cameron considered that pickling on a floor was both quicker and more effective than steeping. He used 1lb. bluestone to 4galls. of water, and that was sufficient solution for 8bush. of seed. Mr. J. Dow favored a heavier seeding per acre. He did not think 2bush. was too much. Mr. J. Fraser said the grubs would take all his crop if he sowed 2bush. per acre, and it was the opinion of members that as a general rule, the thicker the sowing the worse would be the ravages of grubs.

SOWING GRASSES.—Mr. H. A. Cameron read a paper on "Sowing Grass Seeds," with especial reference to rye grass. He favored local seed if obtainable, and would use not less than 1 $\frac{1}{2}$ bush. per acre, and thought that possibly up to 4bush. per acre

might be used with profit. He would plough the land, but only to a depth of 2in, or 3in, and broadcast the seed after drilling about  $\frac{1}{2}$ in. of oats or barley as a cover crop, and either cover the seed with a light harrowing, or, what he considered a better method, by travelling a mob of sheep over the ground in close order. He said rye grass should not be allowed to seed during its first season, but should either be cut for hay or fed off rather heavily, and personally he preferred feeding off. Mr. R. Agnew asked whether rye grass would do well if sown on stubble land. Mr. Cameron replied that he had known that method to be used with good results. Mr. M. D. Cameron thought that it was a mistake to sow barley with rye grass, as barley was a land robber. More attention should be paid to sowing grass seeds, as was proved by the great carrying capacity of pastures in older countries by the laying down of grasses, and considered that every farmer should at least have a plot of lucerne. Mr. T. Gratiwick said that Professor Perkins advocated the use of a light roller for covering grass and other small seed. He believed that Mr. D. Collings, Secretary of the Mount Gambier Bureau, had tried covering the seed with sheep, and pronounced it a failure. The Secretary thought that it would be advisable to sow a mixture of grasses instead of all rye grass. According to reports the Agricultural Department of Ireland had proved that the pasture of mixed grasses was far superior, and more profitable than one variety of grass.

#### KONGORONG.

MAY 1st.—Present: 10 members and four visitors.

FARMING IN THE SOUTH EAST.—The following paper was contributed by Mr. G. A. G. Bamister:—“No matter whether one goes in for cereal crops or for grazing, the land in the first place must be well cultivated, as even the natural grasses grow better on cultivated land than they do on virgin soil. It is advisable to find out which seed is most suitable for this particular class of country. Among many of the settlers wheat does not seem to be held in very great favor. This particular cereal is a great asset to the northern part of the State; why should it not do well in the South East? Wheat is grown in England, New Zealand, and Canada. All of these countries have a very cold climate, and have a greater rainfall than we have in these parts. I am of the opinion that cropping is unnecessary without the use of fertilisers. The South-Easterners seem to go in mostly for oats, and at the present ruling rates 12bush. of wheat are equal to 36bush. of oats per acre, and also mean less labor, bags, and cartage. In regard to the harvesting of the crops, has the harvester, or the reaper-thresher been given a fair trial? It seems to me to be a lot of unnecessary labor to cut and bind a crop, stack it, and then thresh it, when the harvester will accomplish the work in one operation. The growing of summer green feed, such as lucerne, maize, &c., for stock, is a very important item. These crops can be grown on the irrigation system, as there is practically an unlimited supply of water to be had in these parts. With a petrol engine, say 5-horsepower, and a centrifugal pump, one could pump 3,000galls. per hour at a cost of 1s. Id. per hour. By growing lucerne in this manner one should secure at least four cuts 18in. long a year. I prefer cutting to feeding off, as the stock damage more than they eat. Lucerne during the winter months requires a dressing of stable manure. Green feed during the summer months is very beneficial to milking cows. A good dairy herd takes time and patience to get together. A large area of South Australia is wonderfully adapted for successful dairying, and the industry is making great progress throughout the State. Landholders are recognising that it is a profitable branch of agriculture, and some are devoting their attention to it exclusively, rather than as a mere adjunct to cereal growing. An important aid to the rapid development in dairying is the wealth of natural grasses which grows in many districts. The natural grasses maintain the stock in excellent condition throughout the greater part of the year, and enable them to yield milk of a very high standard. The mildness of the climate permits the dairyman to leave his stock in the open right through the year, consequently the shelter sheds need not be extensive, thus saving expense. He is also enabled to dispense in a large degree with artificial feeding. For dairying purposes the Short horns are much in favor. In discussing the subject, Mr. C. T. Atkin mentioned that that district could produce wheat, but a question yet to be determined was the most suitable variety to grow. An interesting debate took place in regard to the relative merits of different methods of harvesting, and Mr. C. T. Atkin mentioned that lucerne would do well in some parts of the district without irrigation.

Mr. D. Uphill mentioned millet as one of the best summer fodders to be grown for cows. Mr. W. Aspin stated that by ploughing up the land and sowing it with speargrass, he had greatly increased its stock-carrying capacity.

#### KYBYBOLITE (Average annual rainfall, 22in.).

May 3rd.—Present: 15 members and one visitor.

**FORAGE CROPS.**—The following paper on this subject was contributed by Mr. S. H. Shinekel. "With the scarcity of stock, chiefly sheep and cattle, it certainly behoves the farmer to produce as much feed as possible to keep them in a good, flourishing condition all the year round. This assures a better percentage in the increase of young stock, a better milk supply, more feed is provided for pigs, all slaughtered stock return greater weights, consequently there is a reduction in the number killed for the farmers' requirements, and if sold to be slaughtered, the returns are higher. This does not only benefit the farmer; it will benefit the community and the British Empire. A few acres of forage crops grown every year should not reduce our wheat returns; in fact they should ultimately increase the production of wheat from a smaller area sown. When we read of the scarcity of meat in England, does it not suggest to us that if we are truly patriotic we should grow much more in the way of forage crops in the immediate future than we have done in the past, and knowing that we are favored with a good rainfall, I feel confident that much more can be done in this direction. Believing this to be true, it then behoves us to learn all we can of the use of such crops. For our district we may class forage crops under seven headings, viz., cereals, white mustard, cabbage family, leguminous plants, root crops, melons, and the sorghum family, and I will deal with them in that order. Of cereals for early green feed we have a fairly large variety from which to choose. The following will, I think, be found suitable to our soils and climatic conditions:—For wheat—Krug's Early, Steinwedel, and Nhill. They are quick growers, and produce a lot of flag. Then we have Algerian and Cape oats, Cape barley and rye—all good for early green feed. If the best results are to be obtained from cereals as green feed they should be sown on well-prepared fallow, failing that they should follow a leguminous crop. Fallow land has a great advantage, inasmuch as it can be sown much earlier, or in other words, grain sown therein will germinate with less rain, owing to the amount of moisture which can be conserved. As all cereals, when grown for green feed are sown early, it is very necessary that they should be sown to a fair depth so that the seed may be in contact with the moisture. For early green feed heavy manuring and thick sowing are necessary as well as good cultivation. A rich, loamy soil generally gives best results, as it retains the moisture very much better than our heavy black soils. The same remarks apply to Algerian oats and Cape oats, rye, and Cape barley, which grow fairly well on our poor, sandy soils, provided it has a liberal application of manure, rye being preferable for that class of land. White mustard for early winter feed must be sown early. It grows well on our heavy, black soils, and also on our poorer classes of soil if well supplied with manure. It is best to sow from 6lbs. to 8lbs. of seed per acre very shallow. Mustard grows very quickly, and makes very good feed for ewes and lambs. It certainly is not best for milking cows, as it has a tendency to taint the milk; it is only good for winter feed. It may be fed off or cut, but always before it goes to seed. In good seasons it may be fed off two or three times. *Cabbage Family*.—Here again we have a wide selection—kale, rape, chou moulle, Chinese cabbage, and others. These plants, like nearly all their kind, are gross feeders, and need heavy manuring. Kale may be sown with a drill in the field or in a small bed like cabbages, and transplanted. If it is intended to be transplanted the seed should be sown in a small bed, about April or May; the plants will then be ready to be put out in July or August. When planting use an old piece of fencing wire, tie pieces of binder twine every 4ft., fasten a stick 4ft. long each end of the wire, fasten the wire to the fence of the field with the stick, pull the wire tight, and peg at the other end. Make a hole with a dibber at each tie of the twine, and put in the plants. When the first line is completed shift the wire the same distance as the length of the stick, and continue doing this until completed, and all the plants will be in rows convenient for cultivating four ways with a Planet Junior cultivator. Cultivating will be found very beneficial for keeping down weeds and conserving moisture for the summer months, but do not cultivate too deeply. At 4ft. apart it takes 2,732 plants to cover one acre, and  $\frac{1}{2}$ lb. seed carefully sown, should easily

supply that number. Chou moullier may be treated in the same way. If sowing kale directly in the field, mix the seed with super at the rate of about 1½ lbs. or 2 lbs. per acre. The land should be worked down pretty fine, and the seed must not be sown deeply. Rape, chou moullier, and Chinese cabbage may be sown in the same way. For rape, use 2 lbs. to 2½ lbs. per acre, chou moullier 1½ lbs., and Chinese cabbage, 4 lbs. to 5 lbs. Never mix small seeds with super, until you are ready to sow them. For directly sowing in the field, we have two seasons of the year, viz., autumn and early spring, say August. They may be sown by themselves or in a cereal crop if it is not too far advanced, and then rolled. In this way the sowing can be done by hand or with a small seed sower. Kale and chou moullier sown in August are not very likely to go to seed the first year, and they will do very little damage, if any, to cereal crops. Do not sow Chinese cabbage or rape with the crop, as it always goes to seed the first year. I have sown chou moullier with wheat and oats in May and June, and never regretted doing so, finding it provides a good lot of green feed for stock during the summer and following winter. If sowing with a cereal crop only use about one-third the amount of seed quoted above. When feeding off any of the cabbage family it is always wise to take the sheep off when the plants are fairly stripped, particularly in the summer months. If constantly fed the plants are likely to die. Should aphis attack these crops at any time feed off immediately. Where kale or chou moullier has been transplanted it is much better to strip the leaves as required, and feed to stock. *Leguminous Plants.*—I cannot claim that I have had much experience with the clover family, so will confine my remarks to peas and vetches. These will grow on almost any soil, provided it has a good drainage. For peas sow about 2 bush. per acre about the end of June or July. I cannot say I have found vetches to be a success by themselves, but they are very useful if sown as a mixture in an early green feed crop. Use one part of vetches to three parts of other seed. *Root Crops.*—We can safely confine these to mangolds, sugar beet, and turnips. Mangolds do best in a good loamy soil. They also do well on our heavy black soil provided it is not too clayey. The land must be heavily manured with stable manure, 40 dray loads is not too much per acre. This should be carted out in the autumn before the land becomes too wet, as the constant carting of manure when the land is wet causes it to become sodden. This is very detrimental to a mangold crop. Carting out the manure in autumn also saves labor in well destruction. Plough the land deeply when the manure is spread and harrow down to a fine tilth to encourage weeds to germinate. As weeds appear kill with a cultivator, or preferably the plough. The more often the land is ploughed the more weeds will be destroyed, and the land will be brought into a good state of fertility. As soon as the mangolds are well through a good eye should be kept on the weeds. Use the Planet Junior freely, but not too deeply. Give the young plants a dressing of salt, from 2 cwt. to 5 cwt. per acre. Salt is a good dressing for mangolds; it will help to check some of the weeds, while it also destroys slugs, &c. Kainit or sulphate of potash are both very useful manures for this crop. If kainit is used the salt may be omitted. When plants are from 3 in. to 4 in. high, thin them out to about 1 ft. apart. When the mangolds have a fair amount of foliage the outer leaves may be stripped, but on no account should the centre ones be interfered with. Mangolds take a long time to mature, and are not at their greatest value until about June, July, and later. They then contain the greatest amount of sugar. When matured they can be pulled out and carefully stored and fed to stock for July, August, and September. With good cultivation and manuring 50 tons per acre can be grown in this district. We have different varieties—the long reds and the globe. The former require a deeper soil than the latter. The yellow globe variety contains more sugar than the long reds, but, as a rule, is not such a heavy cropper, with the exception of Carter's Winsor (yellow globe), which has always given larger returns with me than the long reds. Sowing should be done about the end of August or early in September. The seed can be sown with the ordinary seed drill. A 13 hoe drill suits very well. Take the pins out of the stars or cone of manure feed Nos. 2, 3, 4, 6, 7, 8, 10, 11, and 12. This will leave only Nos. 1, 5, 9, and 13 casting manure, the drill being 21 ft. 4 in. apart. Now set the drill as though to cast 1 cwt. of super per acre, mix 3 lbs. or 4 lbs. of mangold seed with about 30 lbs. of super, put this in the drill, and sow about 1 in. deep. This should sow about one acre. An assistant is required for sowing mangolds in this way. The assistant keeps the lid of the manure box open and constantly stirs the mixed super and seed with his

hand. This prevents the light seed working to the top of the super., and ensures an even distribution. *Sugar beet* requires the same treatment as mangolds, the rows can be closer, and a little more seed used. *Sugar beet* has a much higher feeding value than any mangold, and is deserving of much more attention than it receives. Like the mangold, it involves a great deal of labor, and therefore is not valued by the tired man. Field turnips may be sown during two seasons of the year, viz., autumn and August. They do best on a light loamy soil, and also do well on our heavy black soils, which contain a good supply of humus. Some of our good swamps, when dry, should grow them to perfection. The land must be worked down to a fine tilth. The seed should be sown with the drill, as directed for mangolds, the rows being 14in. or 21in. apart. Use from 3lbs. to 4lbs. of seed per acre, and sow very shallow. No assistant is required for sowing turnips. After cultivation similar to that advised for mangolds turnips can be grazed by sheep, or they can be pulled when matured, stored, and fed to stock as required; they will sometimes keep a good while under cover. Turnips do not require such heavy dressings of manure as mangolds. Scotch purple top have given best returns with me. We have a great deal of light sandy country in this district, which, with very little cultivating or manuring will grow the larger varieties of pie melons. All that is necessary is to plough the land in August, cultivate or harrow about the end of September, walk over the land with the seed, put four or five seeds in a circle, and put the foot on them. Do this about every 5yds., protect the plants from rabbits, and leave Nature to do the rest until they are matured. Sheep eat them very readily when once they get used to them. They can be carted to an open shed, laid on a little straw, and will keep for a long while if carefully stored. Maize, sorghum, and millet do best on a good loam with a good subsoil. They will also do well on our rich black soils in good moist summers. The land should be ploughed early and deep, be well cultivated and harrowed to conserve moisture, they being entirely summer crops. For manure use 1ewt. of super. and 1ewt. of boneclust per acre. A portion of this should be applied before the seed is sown. Sowing should be done about the end of September or October, according to the season. For maize I prefer Horse Tooth and Hickory King. It is best sown in drills 3ft. apart, so that the Planet Junior cultivator can be used. If sown 3ft. apart 20bs. of seed will be sufficient for an acre. If broadcasted more seed is required. *Sorghum*.—I prefer Amber Cane and Saccharatum. If sown in drills 2ft. apart use 4lbs. or 5lbs. per acre, if broadcasted 6lbs. or 8lbs. seed might be soaked for 48 hours in cold water before sowing. Of the millets I prefer Pearl and Japanese. The former I have found to give much more feed per acre, but all stock prefer the latter. If sown in drills 2ft. apart use 4lbs. per acre, more if sown broadcast. The sowing of maize, sorghum, and millets can be done with the ordinary drill, similar to mangolds. Just a few words on the value of forage crops for farm animals. I think we all know, or should know, how they appreciate early green feed such as wheat, oats, &c. It is very useful, in fact indispensable, to the milking cows, young foals, ewes, and lambs, in fact every animal on the farm. Mustard is somewhat different. It is not the best for milking cows, but is very useful for ewes and lambs. Kale, chou moutier, &c., if sown in autumn provide good early winter feed, and if sown in August provide good feed for early summer. They are useful for all stock on the farm. Peas can be fed in the field when ripe, to sheep and pigs. They can be fed in the haulms, or may be thrashed and cleaned, and fed as grain. They are very fattening for sheep, lambs, pigs, and horses. Vetches are best sown mixed with early green feed, and can in that way be fed off by stock, or they can be cut for green feed, as required; and in spring, when feed is plentiful, I understand it is a good mixture for ensilage. Mangolds and sugar beet are very much relished by milking cows, and make a very good ration in the winter months if sliced and mixed with good straw chaff; they also make very good feed for pigs and poultry. Turnips can be grazed by sheep, or be fed to sheep and cows similarly to mangolds. Melons may be fed to sheep, cows, or pigs as soon as they have reached maturity. For sheep they can be fed in the field. Once or twice a week walk through the melons with a hammer, give a few of them a hit, just to knock a piece out, and the sheep will do the rest. For cows, they make good autumn and winter feed sliced and mixed with chaff. They are also useful for pigs, but not fattening. Pie melons will keep for months if carefully stored. Maize can be cut for cows as soon as it has made sufficient growth. Sorghum

and millets are best left until the seed commences to form. Sorghum in particular is always liable to cause a poisonous gas in cows if fed before it goes to seed. These crops, can, I believe, be conserved for good winter feed by putting down alternate layers of straw, maize, sorghum, or millet, and I understand this makes a good stand by for lean years. I have just briefly tried to explain the value of forage crops to stock, and how to use them. *Soil Improvement.*—Let us now see how they affect the soil. In the case of early green feed, such as wheat, oats, &c., if simply cut and fed to stock I certainly fail to see that it improves the soil, but if it is grazed and ploughed in at the end of winter or early spring it certainly improves it, there being an increase of humus, while the excreta of stock, both liquid and solid, will be conserved. If vetches have been included in the green feed, then a fair amount of nitrogen will be conserved for the following crop. Mustard has no special value as a soil renovator in itself, excepting by providing humus; but if fed to ewes and lambs the mustard is converted into manure, both liquid and solid, and left directly on the field. When mustard is fed off for the last time it should be fed very close, and then ploughed. If the land is suitable it will be in good heart for a potato crop. As kale, &c., usually lasts for several years, and carries a lot of stock for that period, the land will generally be found in fair order for a cereal crop. Peas, on account of gathering a quantity of nitrogen and storing it in the soil, leave it in good condition for early green feed, hay crops, and others. Mangolds, &c., require heavy manuring, and are deep rooted, hence they certainly pave the way for any of the cabbage family. I very much doubt if piemelous have any beneficial effects upon the soil. In dry districts maize, &c., can have no beneficial effects upon the soil, but in our own district, which generally has a heavy rainfall, it has been found in a number of instances, that wheat following maize gave better returns than has fallow. The reasons for this I cannot explain, excepting where maize, &c., has been heavily manured.

#### MOUNT GAMBLER (Average annual rainfall, 32in.).

April 14th.—Present: 19 members.

**BEST BREED OF SHEEP FOR THE DISTRICT.**—What was the best breed of sheep was a question frequently asked, remarked Mr. E. F. Crouch in a paper in which he discussed the best breed of sheep for the district, and the answer was that breed which suited one's own particular land. As showing how necessary that was, they should look up the different breeds of sheep grown in the British Isles alone, and they would find that each county had a breed that had been bred to suit local requirements by skilled breeders, if they might judge by the samples that had been imported. They could first take the Lincoln, which was a grand sheep in every way; a picture to look at, and a bale filler, and which carried wool to a good age, and in addition made an ideal cross when mated with the Merino, either using Lincoln rams on Merino ewes, or Merino rams on Lincoln ewes. The cross of the first mentioned was a good class of wool, always commanded a good price, and was of good length, character, and density; but he had found the latter cross of longer staple, dense, and a good quality, and, if anything, larger and more the shape of the dam. He had always been much impressed with the excellent features of this cross, but the point was if they did not suit one's pastures they were no good to him. Another British breed known to them was the English Leicester, a good class of sheep for fattening, but not the heavy cutter that the Lincoln was, but for crossing with small ewes they were very suitable, as the rams were smaller in the head, which was desirable. Then there was the Border Leicester. In some late experiments at the Government farms in New South Wales, they had been found to produce in the competitions the most profitable fat lambs, and had the reputation of being hardy, but they never impressed him as wool-cutters after they were two years old. The Romney Marsh had come into great favor during the last few years, and there were numerous stud flocks in New South Wales and Victoria, and three in South Australia. Those breeders who had used that class of sheep were very well satisfied with them, as being of good constitution, and consequently good doers. On one occasion he saw a lot of half-bred shorn. About half were by Romney rams and the other half by Lincoln rams from Merino ewes. They ran together, after being weaned, and were drafted at shearing time, and the Lincoln

cross beat the Romney by 9oz. average per head, but when the account sales of wool were received, the Romney cross beat the others for most valuable fleece per head. There were more Romney studs in New Zealand than all the other long-wooled breeds put together, and as New Zealand was the great exporter of lamb and mutton the Romney evidently suited the trade. The Dorset Horn impressed his appearance on his progeny, and the lambs seen at the shows were always among the best, and as they matured early and ran into good weights, as a fat lamb proposition they were all right. The neat-looking Shropshire was a good fat lamb producer, and unless one intended fattening off the lambs, the rejects were not equal to other breeds as wool producers, but for carcass sheep they were among the best. The Hampshire Downs were represented in New South Wales and Victoria, and were good fat lamb producers. On one occasion in New Zealand he put 500 three-quarter bred Lincoln ewes to Hampshire Downs rams, and marked 115 per cent, after losing a few ewes in a creek, and a few otherwise; but when the oldest lamb was 3½ months old he sent away 340 lambs, and a fortnight later 160, and the lot averaged 37½ lbs. freezing weight. The following year he put 1,200 similar ewes to Hampshire Downs rams, and secured space in freezing works for 1,000 lambs. As he could not get into the works until the oldest lambs were 4½ months old he had a great number rejected as lambs, and they were put into the mutton class. One of the lambs dressed 73 lbs. The skins from those sold well, but those he kept for another year did wonderfully well as fat sheep, numbers going over 100 lbs., but the yield of wool was disappointing. Southdowns, Cheviots, Oxford Downs, and Cotswolds were, so far as he knew, not represented in the South-East. Last, but not the least in importance, was the Merino, of which breed the greater number of sheep in the Commonwealth consisted. There were a good many types, all bred to suit different localities, and each had its admirers; but there was one thing—the weedy Merino had now no friends. Because in the first place they were not good fatteners, as the production of yolk was too great a strain on their constitution, and unless in warm and really good country it was difficult to top them up, and the blowfly pest was worst in the oily sheep. The Merinos were truly wonderful sheep, because they thrived on the snowy mountains as well as on the hot plains of Central Australia, and they travelled miles to and from water when in their paddocks, which no other breed would do. It was the sheep for the greatest part of Australasia. All the above breeds were monuments of thought and skill, and the country was under a great obligation to the breeders of the different classes, for though one paid three guineas or more for a two-tooth ram it did not pay the breeder so well as raising a fat lamb, for the reason that studs were expensive to establish and keep up, and to be a sneezeful breeder one had to keep his sheep at their best, and give a lot of skilful attention, which every sheep breeder did not possess. Again, some studs were started in country that did not suit, hence their failure. On the richer lands, the heavier breeds were most suitable, but to keep heavy-carrying land in healthy condition it was necessary to plough and provide clean and sweet feed, and a change. In a season such as that just passed the sheep generally did not well, or were less healthy, and sheep just now were too valuable to run any risks with. He had given intra-tracheal injections to lambs suffering from lung worm with the greatest success, and the mixture was turpentine, carbolic acid, and opium. He also tried chloroform instead of the opium, but thought the former was the more soothing, and the lambs stood the treatment better. Everyone had his own cure for intestinal worms, but he found Little's fluid dip—one part dip to 25 parts of water, and the dose 4oz.—a good one. Lambs and sheep that had sore mouths could be cured in a few days by washing the mouth with a preparation of the same strength. He put the fluid in a bottle with small angle-cuts in the cork, and put the sheep in a race. He then took the sheep between his knees, lifted up its head, poured the dip mixture on, and gave it a rub, and in a week's time there would be no sore mouths. Those that were bad would be cured, and the others would have the parasite destroyed. They had, of course, noticed among sheep that some did better than others, and also carried a good fleece. If they had a mixed flock they should by all means get as close as they could to that for this particular class, as they suited one's country. The best thing to test one's wool returns was to see how much money per acre the sheep eat. It was well known that the long-wooled sheep could not be kept on poor country, because the food raised on it was not sustaining enough for big sheep, but some of the crosses in which the Merino had greatest share were the most suitable if one had to keep

**Comebacks of Crossbreds.** He would strongly urge all sheep owners to keep their flocks as even as possible. Then, when they had sheep or wool to sell, they had a line which always attracted buyers; but if their sheep were Comebacks, Crossbreds, long wools, and black faces, they would probably meet with a buyer, but the competition would be among a few; whereas if one had an even lot, every buyer would compete. So with the wool; too many star lots would benefit, not the producer, but the buyer, who would obtain the wool more cheaply on account of the mixture, or that it was in too small lots to attract every buyer. During the last 25 years a number of station owners who were famed for their Merino wool, had given up those sheep and gone in for Crossbreds, and to get sheep suitable for their country they had bred a long wool and Merino cross, and had established a type of sheep that suited the market, and grew a profitable clip of high-priced wool; but he would again urge them to grow the sheep that would suit the country. Mr. A. J. Weld said his idea was to mate a good strong Merino ewe and a Lincoln ram to produce a breed for that district that could not be improved by much. With other crosses there always seemed to be a lot of rejects when the lambs were sold. He thought that if they stuck to Cross-breds in the way he stated they would do better than if they went in for other sorts. Mr. Holloway thought South-Eastern sheep men were generally satisfied with the Merino-Lincoln cross. Mr. Henshaw Jackson, the wool expert, was an advocate of the Merino and Leicester cross. Mr. G. H. Kilshy said he had for many years advocated the Lincoln-Merino cross. He thought that if they got them good on both sides they would get an improvement on other crosses in good country. Mr. Crouch mentioned the Hampshire Downs cross. He should like to see that cross tried. They had none in South Australia. When he was in Sydney recently he saw a line of that breed from the Goulburn district, and it topped the market. They were a very fine lot of sheep. They matured early, and were very good cutters. Touching on what Mr. Holloway had said about the Leicester-Merino cross, he might say he happened to be in Victoria when a man, who probably sold more Leicesters than anyone else in Australia, told him that there was a great demand for them, especially in the northern country, but he thought the Lincoln cross would be the best for the South-East. There were only two wool breeds, he said, in the world. The Merino could not be equaled by any breed for fineness of wool, and the Lincoln for weight; and the cross from those would be a fine utility sheep. On the other hand, with the other breeds, one would get a light woolled cross, and in a short time he would not know where he was. Mr. H. L. Kennedy observed that besides using a sheep that suited the country in large areas they must use a sheep that suited the farm as well. With the big English breeds they wanted a limited area on which to run them. None of the crosses found favor with the graziers like the Merino and Lincoln cross. The cross from the Merino ewe and Lincoln ram was the ideal sheep for the farm. Of course, when the wool became too strong it would be necessary to breed back by introducing finer-wooled sheep. Mr. A. A. Sussanovsky thought the Merino and Lincoln cross was the most suitable breed for the district. At some future date, if lamb breeding came in again extensively they might go back to the Shropshire. For the ideal freezing lamb he did not think they could beat the black-faced sheep; but for carcass, and particularly for wool, he did not think they could beat the Lincoln and Merino cross. There was another cross coming in favor—the Corriedale and Merino cross. In some places in New South Wales and New Zealand, and also at Millicent breeders were going in for the Corriedale strain. It was a useful sheep; produced a good lamb and a fair fleece of good quality. At sales they brought equal prices that others did. Mr. Ellis had, he thought, gone in for Corriedales for years, and he thought his wool realised practically top prices. But for the farmer, at present he did not think they could beat the Cross-bred Merino and Lincoln. The great object was what one could make per acre out of their sheep. In that case it was possible that the Merino might suit them better than Crossbreds, for it must be remembered that where they could keep two Crossbreds they could keep three Merinos, and at the end of the season, when they calculated their returns they might find it suited them better to keep Merinos than the Crossbreds. Mr. McCormick asked with regard to the Lincoln and Merino cross, how they were to keep the breed up to the standard? Mr. Kennedy said that when the wool of the flock got too strong they would have to go back and cross again with Lincolns. Mr. A. A. Kilshy said last year he got a few Shropshire rams and obtained some very good lambs, but he did not get them for freezers. He was rather afraid that if he did

not get them off he would not know where he was. So he got rid of the Shropshires, and replaced them with Merinos. Instead of putting the Crossbred ewes with the Lincoln rams, he put the Lincoln rams with the Merino ewes, and later got Merino ewes and put them with the Lincoln rams, and he thought that breeding in that way they would get a good class of wool and a fair carcass, weighing up to 70lbs. and 80lbs. He had had the distinction of topping the Adelaide market three years running. He thought by keeping on to the Merino ewes instead of mating Lincoln rams to Crossbred ewes, and mating the Lincoln with them again he would get the most suitable sheep. If they kept the Lincoln cross and improved back to the Merino and the Lincoln cross they would get a fine class of wool.

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MOUNT GAMBIER (Average annual rainfall, 32in.).

May 12th.—Present: 20 members.

**OBJECTIONABLE WEEDS.**—A short address on the subject of objectionable weeds was delivered by Mr. R. Wallace. He mentioned several plants that could well be done without, such as wild radish, blue root (which could be got rid of by pulling), wild turnip, and the red poppy. The Canadian thistle and horehound were also referred to. A general discussion followed, and it was determined, at the instance of Mr. R. Fowler, that members should collect objectionable weeds, table them, and discuss them at a meeting of the Branch.

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NARACOORTE (Average annual rainfall, 22.60in.).

April 14th.—Present 28 members.

**PROPOSED JUNIOR TECHNICAL SCHOOL.**—Commencing with the inquiry whether technical education, with an agricultural bias, for boys or girls, was an advantage in agricultural districts, Mr. S. H. Shinckel, in a paper on the proposed junior technical school for Naracoorte, answered the question in the affirmative. In older countries great attention was paid to the agricultural education of children with beneficial results, and the same effect should be produced in that district. Boys especially would be benefited by an insight to the science of farming, which could be obtained on very few farms. Technical education would afford the student an early opportunity in life of learning bookkeeping, besides acquiring an insight into carpentry, blacksmithing, chemistry, analysis of soils, balance in soil solution, diseases of stock, farm botany, insect pests, fungus diseases, and other subjects. In technical schools with an agricultural bias a few acres of land for the purpose of observation and experience in the growing of various plants would be indispensable. It was a good policy to encourage boys and girls to be fond of plant life. The condition of fences, doors, gates, &c., on a farm, where the owner had a knowledge of tools could at once be distinguished as against the holding of the farmer who had no such knowledge. All the pupils attending junior technical agricultural schools would not go on the land, but the education received would be of use in any walk of life.

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KYBYBOLITE, April 2nd.—Mr. Mehren (Danish Agricultural Expert) delivered an address on the agricultural and dairying methods practised throughout Denmark. He also referred to their system of education and co-operative methods, which in latter years had largely increased the production of Danish commodities.

TANTANOOLA, April 27th.—**CO-OPERATION.**—This subject was dealt with in a paper by Mr. J. Cartew. He referred to the many benefits that would accrue to the farmers if the principle of co-operation were more generally adopted, and he urged farmers to protect their interests in this manner. The paper met with a good reception, and was well discussed.